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NINTH ANNUAL REPORT

OF THE

STATE BOARD OF HEALTH

OF THE

STATE OF NEW HAMPSHIRE

FOR THE

YEAR ENDING OCTOBER 31, 1890.

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MANCHESTER:
JOHN B. CLARKE, PUBLIC PRINTER.
1890.

STATE OF NEW HAMPSHIRE.

OFFICE OF THE STATE BOARD OF HEALTH,
STATE HOUSE, November 1, 1890.

To His Excellency the Governor and the Honorable Council :

In conformity with the laws of the State of New Hampshire, I have the honor to present herewith the Ninth Annual Report of the State Board of Health, for the fiscal year ending October 31, 1890.

Respectfully submitted.

Irving A. Watson

Secretary.

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MEMBERS OF THE BOARD.

Gov. DAVID H. GOODELL	Antrim.
Att'y-Gen. DANIEL BARNARD . . .	Franklin.
Hon. JAMES A. WESTON	Manchester.
G. P. CONN, M. D., *President*	Concord.
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IRVING A. WATSON, M. D., *Secretary* . .	Concord.

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REPORT.

The ninth annual report of the State Board of Health, like its predecessors, represents only in a small measure the work of the Board, or the sanitary progress that has been made in the State during the year. Indeed, but little attempt is made in this direction, and that only in a general way, otherwise the reports of the Board would become voluminous records of correspondence, nuisances abated, investigations made, advice given, etc., etc., without a commensurate value to the public. We endeavor to present a record sufficient to indicate something of the general sanitary advancement that is being made, and to offer such additional matter as will give sanitary instruction to the public. This is in accordance with the plan originally adopted by the Board, and we have seen no reason to change it. How much such a course has had to do with the very marked progress in sanitation which has taken place in New Hampshire during the existence of the Board, we are unable to say; but we believe no small part. This progress is evident in every city, town, and village, as well as in hundreds of segregated homes throughout the State. The need of sanitary work has been made plain to thousands, else the results that are everywhere witnessed would not have been accomplished.

While the Board has been ever active and aggressive, it cannot arrogate to itself the honor of alone accomplishing so much for the public good. We would first of all acknowledge the grand work of the press, of nearly or quite every newspaper in the State in supporting the endeavors of this Board by spreading broadcast information upon hygienic subjects, thereby making it possible to secure sanitary reforms that, without such aid, would have been impossible, or at least much longer delayed. Also, we have the hearty co-operation of the medical profession, and of other active sanitarians in almost every town.

It is, of course, within the expected and legitimate province of a state board of health to inaugurate sanitary work; to urge and stimulate local boards to the performance of their duty; to advise and recommend action if deemed necessary; to establish certain rules and regulations; to enforce measures for the restriction and prevention of disease; in fact, to be ever watchful of the public health interests of the State. These duties, always onerous, frequently perplexing, have been made much less burdensome, and the results have been proportionately greater, through the hearty and cordial co-operation which we have received from all sources.

Another evidence of a growing interest and belief in the prevention of disease, is manifested in the fact that each year brings to the Board an increased amount of work, especially in the direction of advice and recommendations, sought from individual sources, concerning unsanitary environments and conditions of almost every kind and character imaginable. The people more largely than ever before realize that there is often a relationship between uncleanly surroundings and ill health, that disease does not appear without a cause, and hence the intelligent efforts that are now being made to avert many a physical disaster that formerly was not known to be preventable. This, if there were no other evidence, indicates that the work of the Board, augmented and emphasized by the co-operative aids above recognized, has educated the people in sanitary matters to an extent doubtless unexcelled, if equaled, by any other State in the Union.

SANITARY ADVANCEMENT.

The general sanitary advancement, therefore, is to a high degree satisfactory. We have only to look back a few years to see that there has been a most notable progress. It is probably safe to say that there is not a town in the State but is in a better sanitary condition than it was five years ago, and in many rural towns the continuance of undesirable conditions at the present time is owing to the lack of funds rather than to a total ignorance of their bearing upon life and health. Towns that for generations gave no thought to hygiene have been aroused from their inactivity to intelligent and systematic action, and the results are to be

witnessed on every hand. Typhoid fever has almost vanished from some towns that formerly had an annual outbreak of the disease. Scarlet fever has been greatly lessened by isolation and disinfection, and diphtheria by the same means is rendered less fearful to any community that will avail itself of these safeguards. No progressive town to-day thinks of neglecting sanitary matters, or of ignoring an outbreak of infectious or contagious disease, as was formerly the practice.

We have in the State many efficient and active local boards of health, and their number is increasing with each year. The average citizen is also better informed in regard to the sanitary necessities of his town and the importance of sanitation to private and public interests. Private interests, however, are the greater stimuli to sanitary action, as evidenced by the work accomplished in manufacturing communities and in towns frequented by summer boarders.

Public institutions, almshouses, asylums, etc., have been placed upon a more healthful basis; public water-supplies are rapidly increasing and supplanting the often dangerously polluted well; sewers have been constructed in towns where, but a short time ago, the proposition would not have received a half-dozen votes. Thus there are many proofs of a sanitary advancement that is contributing every day to the material prosperity of the State, as well as to the happiness and comfort of thousands of our citizens.

SUMMER RESORTS.

There are tens of thousands of summer visitors coming into the State annually in search of recreation and health. A majority of these visitors are of the most intelligent class, and are, as they should be, ever watchful for agreeable and healthful surroundings. They demand that the conditions shall be such that the danger of incurring disease therefrom shall be reduced to the minimum. The advice and earnest efforts of this Board have been to the same end, while the local board in many a summer-resort town has been creditably active and watchful.

We have inspected, or caused to be inspected, many of our summer hotels and boarding-houses and have repeatedly urged

upon the proprietors the importance of good sanitation, and the pecuniary benefit accruing therefrom. It is not a difficult matter to secure the needed improvements, when it is known that a single case of diphtheria, typhoid fever, or other zymotic disease, means an immediate loss of business; and as a rule the summer-resort property-owners pay close attention to the sanitary needs of their respective places.

We maintain that it is the duty of the State to protect, as far as it is able, the health of the thousands who visit this "Switzerland of America" each year. The money which they leave is of incalculable benefit to the State, for which the latter should extend its protection and provide every comfort, facility of travel, and every courtesy that it can reasonably vouchsafe. The summer traveler has made valuable many a valley and hillside that without his patronage would not be worth the taxes now paid upon the property; supports schools and churches; builds better highways; beautifies and vivifies many a town that but for him would be moss-grown and silent; constructs and maintains railroad lines; exerts a moral and educational influence; contributes to the culture and intelligence of many localities; increases property valuation; and in innumerable other ways adds to the welfare and prosperity of the State. First, then, among our obligations to the summer visitor is the protection, as far as possible, of himself and family against diseases arising from sanitary neglect or oversight, to accomplish which a large work has already been accomplished. Our resorts, as a rule, are in excellent condition, but they require constant supervision in order to keep them so.

RAILROAD SANITATION.

There has been for the past few years an annual improvement in the sanitary condition of our railway stations and grounds. The progress in this direction has been in keeping with the general advancement in hygiene. We have made frequent inspections of the stations and have offered occasional recommendations, many of which have been carried into effect. It is the settled policy of our railroad corporations to provide, as far as possible, sanitary appointments of the first order. To this end much good work has been accomplished by the Concord & Montreal and the Boston & Maine railroads, although there are some

stations that are still subject to severe criticism. It should be stated in connection with the latter, that improvements are promised to be made as rapidly as practicable.

It is gratifying to report that the railroads of the State heartily co-operate with this Board in all efforts to secure sanitary improvements.

ALMSHOUSES.

In the last annual report of this Board a general statement was made of the sanitary condition of the almshouses and some of the penal institutions of the several counties, hence it is deemed unnecessary to make another report at this time. It should be said, however, that a careful inspection of these institutions has been made by the Board during the year, and it is gratifying to be able to state that some very marked improvements are being made. Chief among these should be mentioned a new brick building for the insane in connection with the Cheshire county almshouse; a new jail in Coös county, to take the place of the disgraceful and dilapidated building that constituted the former jail; also some improvements at the Carroll county almshouse, by providing protection against fire, new bathrooms, better ventilation for the jail, etc. Minor improvements have also been made at some of the other almshouses. There is scarcely an almshouse in the State that has not been very materially improved during the past few years, and as a whole they are at present in a very creditable condition, but by no means has the limit of improvement been reached in some of them.

In most instances the recommendations of the Board have been favorably entertained by the county commissioners and county delegations, and the necessary appropriations made to carry the propositions into effect. There are, however, some conditions that require remedying, and these will be acted upon as soon as practicable. Our county almshouses, as at present administered, are most beneficent institutions, making comfortable homes for a large number of unfortunate persons, some of whom were never before so well cared for. There is at the present day a tendency to take some pride in these institutions rather than to regard them as mere necessities, as has formerly been the case.

THE COMMISSION OF LUNACY.

The State Board of Health, under a law passed in 1889, is also the Board of Commissioners of Lunacy. The additional work thus placed upon the Board has been of considerable magnitude during the first year of the Commission. It has been necessary to make a personal examination of between four and five hundred insane persons, with a view to selecting those whom it might be deemed best to give remedial treatment at the New Hampshire Asylum for the Insane. In addition thereto, the Board has made frequent inspections of the several county asylums, also the state asylum.

This work has not yet been in progress long enough to afford any statistics or deductions of special value; but the necessity for such a work has been most emphatically proved. Thus far, between eighty and ninety insane persons have been removed, mostly from the county asylums, and given remedial treatment at the state asylum. These cases were from the so-called "incurable" class. Already there has been about thirteen per cent of recoveries, besides a large number who have been materially benefited. This fact alone is sufficient to show the wisdom of such a movement in the treatment of our indigent insane.

A special report upon the work of the Board of Commissioners of Lunacy will be published annually, the first report to embrace the work for the year ending October 31, 1890. All persons particularly interested in this work are referred to that report.

REPORTS ON DIPHTHERIA AND TYPHOID FEVER.

The reports from the physicians of the State, concerning typhoid fever and diphtheria, which have been published in the annual report of this Board for several years past, are omitted this year, as it is believed that the public have been pretty well informed concerning these diseases, and are thoroughly alive to the importance of sanitation in their prevention. The testimony of physicians has been more pronounced and emphatic from year to year that unsanitary conditions, if not the direct, are at least the exciting cause in a majority of cases of these diseases. There has been some difference of opinion as to the exact etiology of diphtheria and typhoid fever, but that unsanitary conditions have

a close connection with their causation and development, as well as greatly lessen the chances of recovery, is the almost unanimous opinion.

We know these reports have done a vast deal of good, and that their teachings have permeated, to a greater or lesser extent, every community in the State.

In this report we take up a subject of still greater importance, and present the testimony of our physicians in regard to pulmonary consumption.

LOCAL BOARDS OF HEALTH.

The work now being done by the local boards of health is very creditable as a whole. Elsewhere may be found sanitary reports by these local health officers, in nearly every town and all the cities of the State, which substantiate this statement. There are towns, however, in which the subject of sanitation is sadly neglected, — not always from a lack of appreciation of its worth, but owing to financial inability to make the needed improvements. In the cities and larger towns, as well as in some of the smaller, a local board of health is elected, while in a majority of the towns, including most of the smaller ones, the board of selectmen, failing to appoint, are *ex-officio* health officers. We are of the opinion that it would be better if a board of health were elected or appointed in every town. It is seldom that a board of selectmen are as well qualified to perform the duties of health officers as some others who might be selected. In all towns where health officers are not elected at the annual town meeting, the selectmen have authority under the law to appoint such officer or officers. In some towns, however, the selectmen have shown themselves to be very efficient in health matters. The sanitary improvements accomplished in many towns are very noticeable, as compared with the conditions existing a few years ago. While a few towns are liable to criticism for their neglect of sanitary duties, our local boards of health are, as a whole, doing a most creditable work for their respective towns and for the State at large.

SECRETARY'S REPORT.

PULMONARY PHTHISIS.*

The high rate of mortality from consumption, as shown by the registration reports of the past few years, has led to the consideration of the subject by this Board, with a view to presenting some information to the people at large that may materially reduce the death rate from this disease, inasmuch as it is now almost universally conceded that this should be added to the list of "preventable diseases."

In volumes 7 and 8 of the report of the State Board of Health this subject was discussed at some length, and regulations for the prevention and restriction of the disease were suggested. During the past year we have thought it advisable to secure the opinions of the physicians of the State upon certain points in connection with the disease. To this end a blank containing the following questions was prepared and sent to the medical profession throughout the State:

STATE OF NEW HAMPSHIRE.

REPORT ON PULMONARY PHTHISIS.

[We desire that the following questions be answered in the fullest and most complete manner possible, according to the knowledge and experience of each physician in his own practice. STATE BOARD OF HEALTH, 1890.]

TOPOGRAPHY.

Please give the topographical characteristics of your town, including, as far as you can:

1. Nature of soil.
2. Geological formation.
3. Relative acreage of hill, flat, and swamp land.
4. Is there much stagnant water?

*The terms "Pulmonary Phthisis," "Phthisis," "Phthisis Pulmonalis," "Tuberculosis," "Pulmonary Tuberculosis," "Pulmonary Consumption," and "Consumption" are used in this report as synonymous terms, although some physicians make a slight distinction in their use.

PHTHISIS.

5. Are cases of pulmonary phthisis very frequent in your practice?

6. Do you believe the *bacillus tuberculosis* to be the cause of the disease?

7. In your opinion, what are the more frequent *predisposing* causes of this disease?

8. What part in the causation of this disease is due to imperfect ventilation? What to dampness?

9. Do you think that bad ventilation of schoolhouses has had much to do with causing consumption later in life?

10. Have you known of any cases which were pretty surely caused by unsanitary conditions? If so, please give particulars.

11. Please give any cases which seem to illustrate the hereditary tendency of the disease.

12. Please communicate any observations which seem to show the infectiousness of phthisis.

13. What sanitary measures would you recommend to prevent the spread of the disease?

14. To what extent would you recommend the isolation of patients with this disease?

15. Would you recommend the disinfection of the sputa?

16. What protective measures would you recommend in families having a hereditary tendency to develop or acquire the disease?

17. Have you occasionally or ever observed complete recovery in cases of this disease?

18. What measures, aside from medical treatment, would you recommend as being of the greatest benefit to those whose means do not admit of change of climate or extensive travel?

19. What general measures would you recommend to reduce the large mortality from the disease?

Following are the replies returned, arranged in a condensed form. We believe they contain matter of the most vital importance to the people. There are some features of the reports that are especially noticeable, and to which particular attention is called:

1. It is very evident that the physicians have given the subject a very careful consideration, and have been particularly careful in expressing their opinions.

2. Upon some points, especially those relating to the exciting causes of consumption, and the methods to be employed in the prevention and restriction of the disease, there is a marked unanimity of opinion.

As to whether or not the disease is caused by the *bacillus tuberculosis*, there is some difference of thought, although a large majority of those reporting regard the bacilli as the cause of pulmonary phthisis. This, however, is a medical question and has no particular bearing so far as the public are concerned. It should also be borne in mind that the opinions expressed are based upon individual practice and observation of the disease as it prevails in New England.

No preface or review can do justice to these reports, and we therefore commmend their careful consideration to all persons interested in this important subject.

Acworth — Sullivan County.

GEORGE N. POWERS, M. D.

Topography. — The soil is of sandy loam; geological formation, sandstone and mica; nine tenths of the town is hill land, very little flat land and no swamps of any extent. There is no stagnant water near dwellings, and probably not ten acres of wet, undrained land in town.

Phthisis. — Cases of pulmonary phthisis are not very frequent in my practice. There have been several cases in town within the past five years. Allowing me to judge, there have been as many cases as in any other town in the State in proportion to inhabitants.

I do not believe the *bacillus tuberculosis* to be the cause of the disease. In my opinion the more frequent predisposing causes are, in general, anything that lowers vitality; inherited weak digestion or assimilation, phthisis always coming by way of the digestive function; sexual excess by masturbation or intercourse; excessive menstrual flux; too frequent gestation; exposure to filth, bad food, bad air, bad dwellings, bad ablutions, bad drinking-water.

Probably one half of the cases are due to imperfect ventilation; very little directly to dampness; indirectly, dampness causes many cases.

A priori bad ventilation of schoolhouses would have, and doubtless has had, much to do with causing consumption in later life. No question but imperfect ventilation of schoolhouses has

started, in many a life, diseases which have terminated in consumption.

Have known of two cases which were pretty surely caused by unsanitary conditions, — two women who worked very hard and drank contaminated water; their food was evidently not of the best, and their sleeping-apartments were never ventilated.

Have had no experience that would indicate the inheritability or infectiousness of phthisis.

Would recommend, medicinally, antiseptics, antiferments, pure ingesta for stomach and lungs, to prevent the spread of the disease. The board of health should place in every family a printed circular of warning. Would isolate the patient only as a sanitary measure.

Would recommend the disinfection of the sputa, and everything else. Inhale disinfectants and take them into the alimentary canal.

In families having a hereditary tendency to develop or acquire the disease I would recommend, as protective measures, good food, good air night and day, thorough sanitation in all that affects the bodily condition.

Have never been called to a case until too late for recovery. The board of health could do more than any other agency in the State to mitigate this disease, for it endeavors to prevent disease.

It must be admitted by all that proper food, good ventilation and drinking-water, and the stopping of all drains upon the system will do more for tuberculous patients than travel or change of climate — and I may as well add, than medicine.

To reduce the large mortality from this disease, I should advocate thorough sanitation. Send to every family in the State a statement of the causes of phthisis, as set forth by the physicians of the State. Warn the people as often as the quack tells of his medicine for sale. Post it, bring it before the people, advertise it in every way. Remember what God said to his prophet: "If ye fail to warn them, their blood will I require at thy hand."

AMHERST — HILLSBOROUGH COUNTY.

HERBERT D. HICKS, M. D.

Topography. — In the village the soil is sandy, covered by twelve to eighteen inches of loam, and overlying, at the depth of about twenty feet, quicksand. Outside the plain on which the village stands, the ground is generally higher, breaking into hills. The soil resembles that of the village in its sandy nature. Granite rocks break the surface. The hill and flat lands greatly preponderate over the swamps. There is very little stagnant water.

Phthisis. — Cases of phthisis are not of frequent occurrence in my practice, and even then are usually of mild character and slow course.

According to the present state of our knowledge of bacteriology I believe the *bacillus tuberculosis* to be the cause of pulmonary consumption. The experiments of Koch, by which the bacillus is isolated from the sputum of phthisical patients, cultivated and introduced into the systems of healthy lower animals with the unvarying result of reproducing the disease, and again finding the bacillus in the organism of the animal, seem to me to establish this fact in a manner which cannot be controverted.

In my opinion the more frequent predisposing causes of the disease are: 1. An unhealthy condition of the system, by which its power of resistance to the bacteria of the disease is weakened and the blood becomes a fertile soil for the growth and multiplication of germs; this may be caused by confinement in poorly ventilated rooms, especially in company with those who are already tuberculous; 2. Exposure to cold or dampness, which depresses the vital powers and thus decreases the power of resistance to disease; 3. Poverty which entails poor food, and insufficient clothing which also depresses vitality; 4. Attendance on those ill with phthisis.

Imperfect ventilation plays a great part in the development of the disease, as witness the great frequency of phthisis in New England during the early part of this century and until within twenty or thirty years, during which period the open fireplace was closed and the air-tight stove introduced. Dampness is not so prominent a factor, except when it accompanies poor ventilation; but all

germs are more viable in a moist atmosphere than in a dry one. Dampness also lowers the temperature of the body and thus aids in depressing vitality.

I do not think the bad ventilation of schoolhouses has had much influence in causing consumption in later life, unless the bacillus has been introduced into the system by that means. I think the disease cannot remain latent for any length of time without showing itself in some manner. Imperfect ventilation is common in a majority of our schoolhouses, yet it is a rare thing to find a tuberculous child.

I can recall some cases which I think were *developed* by unsanitary conditions. Mere unsanitary conditions of themselves can not *cause* the disease; the *bacillus tuberculosis* must be present, either in the patient's system in a latent or undeveloped state, or in the patient's surroundings ready to be introduced into his system. This being the case, the unhealthy conditions may aid in starting the disease. One case of this character which I recall, a woman, lived in a house where the windows were seldom opened, especially in winter; the rooms were heated by a coal stove; she and her husband occupied a sleeping-room about ten feet square; the air in the house always had a foul odor. The woman developed phthisis of right apex, resulting in cough with nummular sputa streaked with blood, also raised large quantities of blood. Had dullness of right apex, tubular respiration, fine crepitant rales and blowing sounds on inspiration and expiration corresponding to heart sounds. Could not learn that any of her relatives were consumptive. Case two, a man, working all day in a hot, unventilated shoe shop (in winter), developed phthisis in both apexes.

I do not believe the disease is hereditary.

The following cases would seem to show the infectiousness of the disease: A man of this town died of phthisis, his two daughters caring for him during his illness. They lived in an unventilated house. Three or four years after, one daughter developed phthisis, lived several years and then died. The second daughter, who was in attendance upon the first, has died of the same disease within a year. Another case, a man of this town, died of phthisis. His son, then a boy of nine or ten years, has developed phthisis

within eighteen months of this date (August, 1890); the disease is at present in a quiescent state. The third case, a woman of sixty years, has died of the disease within a few months. She was ill enough to require the care of her son for about ten months, during which time he was constantly near her. He has developed the same disease, which is at present making rapid progress. I can also recall one or two instances where either a husband or a wife has contracted the disease while waiting upon the other. In all these cases enumerated the patients who contracted the disease were previously healthy.

As sanitary measures for the prevention of the disease I would recommend: 1. Ventilation; there is nothing better than an open fireplace with a fire in it; 2. Isolation of the patient; 3. *Disinfection of sputa*, clothes, utensils, also bed furnishings, dishes, and in fact everything that has been used by the patient or been in the same room with him.

I would isolate the patient to the extent of having him sleep alone, and if confined to the house he should be in a room by himself. Of course it would be impossible to forbid communication with the patient's family. Children should not be fondled or kissed by tuberculous patients. He should have, as far as possible, separate linen, dishes, and utensils, and these should be disinfected after use. The hands and clothing of his nurses should also be disinfected.

I would most certainly advocate the disinfection of the sputa. Not only should the sputa be received in a vessel containing a strong disinfectant, but all rags or linen used should be disinfected before washing, or, what is better still, burned. If the sputa is received in a paper cup, both can be easily burned.

As protective measures in families having a hereditary tendency to develop or acquire the disease, I would recommend free ventilation of dwellings, an outdoor life, good food, warm clothing, flannel or other woolen worn next the skin, gymnastic exercises proper for the development of the chest and strengthening of the lungs. If the patient's calling necessitates his confinement in ill-ventilated rooms, he should be advised to obtain employment in some outdoor occupation. Medical aids to increase the nourishment of the system are serviceable. If

possible, the dwelling should be on high land, well drained, and the sunlight given free access to the chambers and other rooms. The milk used should be examined to insure its freedom from the *bacillus tuberculosis*, and the cows from which it is taken should also be examined.

I have known of cases of this disease in which the symptoms have disappeared, but I should hesitate to say that the disease was entirely cured. I know of some cases in this town where the disease is in a state of repose, but I think that under certain conditions it might be again awakened. At the most, I should say that the powers of resistance to the disease were greatly weakened.

Aside from medical treatment, I would recommend to those whose means do not admit of change of climate or extensive travel, an outdoor life and occupation. I direct patients to be out in all weathers, except, of course, storms and heavy rains, to dress warmly, to wear flannel next the skin, to avoid getting feet or other portions of the body wet. I consider the outdoor life to be almost curative in mild cases or in those just beginning to develop. The great advance which is being made in the knowledge of antiseptics leads me to hope that something will be discovered that, being taken into the system, will, either by its presence in the blood or its elimination by the lungs, kill the bacilli and thus cure the disease.

To reduce the mortality from phthisis I would recommend the isolation of those confined to the house, and all other measures enumerated above. In case of death, the room and everything that has come in contact with the patient should be thoroughly disinfected. The necessity for the latter measure is well shown by the chart on pp. 14, 15 of the Annual of the Universal Medical Sciences, 1889, being the "location of all deaths from phthisis, hemoptysis, and tuberculosis of every kind which occurred in the fifth ward of Philadelphia for twenty-five years (1863–1887)." It is interesting to notice that, in a majority of the cases, where one case has occurred in a house others have followed; in some houses several cases have followed, and in one house thirteen have died of the disease — and no one knows how many have been attacked with the disease and

have either improved or removed elsewhere. With our present knowledge of antiseptics and disinfectants, is it too much to say that this showing of Philadelphia's death trap might have been changed and its numerous dead have been alive, perhaps, to-day had the proper measures been carried out in those houses with the first appearance of the disease?

Berlin Falls — Coös County.

FRANK A. COLBY, M. D.

Topography. — The soil is a light, sandy loam from one to five feet deep over the underlying rock. The geological formation consists of coarse Berlin gneiss, found in the White Mountain region of New Hampshire, and is composed of dark gray quartz, light-colored feldspar, with much black mica; coarse granite in massive veins, with "dikes" of trap of great width and of dark greenish color; great deal of schist. The township is mostly mountainous, parts of Pilot, Pliney, and Crescent ranges of mountains in the territory. The land is very broken. The Upper Ammonoosuc, Dead, and Androscoggin rivers traverse the town. A small part of the area is swamp; mostly hilly and mountainous, with rapid streams and many arable strips along the valleys; 31,000 acres in township; 1,500 under improvement, the remainder mountains and forests. Very little stagnant water.

Phthisis. — Cases of this disease are not very frequent in my practice; occasionally have a case.

Do not believe the *bacillus tuberculosis* to be so much the cause of phthisis as is the total ignoring or ignorance of the rules of hygiene.

In my opinion the more frequent predisposing causes are heredity, diet of salt pork and kindred abominations still adhered to by farmers, and an innutritious diet among laborers in crowded tenement houses. Among women, following fashions gotten up for warmer climates, thin shoes, small bonnets, and cotton or no underwear, and among men, whisky and tobacco and working in certain manufactories, as chemical pulp mills, under sawmills, etc., have a tendency to develop the disease. Imperfect ventilation probably causes one half of this disease; small per cen due to dampness.

I think the improper ventilation of schoolhouses has had much to do with causing consumption in later life, especially among girls of feeble constitution and with a hereditary tendency.

Have known of four cases, men who worked in sawmill in a damp place, in which no other cause than unsanitary conditions could be assigned for its development. Two cases occurred in men working in a chemical pulp mill, burning black ash. In one family the death of a mother, her two sons, and her two sisters would seem to indicate the hereditary tendency of the disease.

As sanitary measures I would recommend pure air in houses, cleanliness of person, woolen underwear in our changeable climate, isolation of pronounced cases, attention to rules of hygiene, good, wholesome, nourishing food. This for families. State legislation regarding over-crowding of houses, tenements, etc., viz., fresh-air law and enforce it.

At certain stages and under certain conditions of the disease, would isolate it as rigidly as diphtheria or small-pox.

I would recommend the disinfection of the sputa, also all excreta emanating from the patient, as feces, sputa, urine, and all products thrown off. The bedding should also be thoroughly disinfected.

As protective measures in families having a hereditary tendency to develop or acquire the disease, would recommend, besides the above measures, change of climate, upon the first symptoms of the disease, to an equable, sunny locality. Avoid marriage.

Possibly there may be complete recovery from phthisis. Think I have observed it, but am very uncertain. I wish there might be public institutions, in the healthiest and best locations in our State, where patients could have proper care, food, air, exercise, and light, and where hygienic measures would be enforced.

As general measures I would advocate education in the public schools in regard to the nature of the disease and preventive measures necessary for its restriction and prevention; arouse public sentiment to the gravity and danger of the disease; restriction of marriage under certain conditions.

Bristol — Grafton County.

J. M. BISHOP, M. D.

Topography. — The soil is stony, but fertile. The land is very hilly, except along the rivers; no swamps.

Phthisis. — Cases of this disease are not frequent in my practice. Am not fully decided in my opinion as to whether or not the *bacillus tuberculosis* is the cause of the disease. Am of the opinion that any thing or condition that diminishes the free action of the lungs or lowers the vitality of the system, for a longer or shorter period of time, is more frequently the predisposing cause. Imperfect ventilation and dampness no doubt have an influence in its causation. Have never thought that the imperfect ventilation of schoolhouses had anything to do with the consumption of later life; do not think it has in the public schools.

Have never known a case that appeared to have been caused by unsanitary conditions; know of none that would seem to illustrate the hereditary tendency or the infectiousness of the disease.

All those measures which are conducive to good health are to be recommended in connection with phthisis.

No person should sleep with a tuberculous patient, neither is it advisable for any one to be confined to the same room for any length of time. Would recommend the disinfection of the sputa.

As protective measures in families with a tendency to the disease, I would recommend a dwelling as free as possible from sudden changes of temperature; cool air; free exercise in the open air; walking, when strength will permit, when not, riding or swinging; gymnastic exercises of such kind as will strengthen and develop lung capacity; cold sponge bath daily, with brisk friction.

Think I have observed complete recovery from the disease in one instance.

In general, all measures that have a tendency to restore and maintain the condition which we call "good health" should be advocated.

Brookline — Hillsborough County.

C. H. HOLCOMBE, M. D.

Topography. — The soil is of light loam in central portion of the town, heavier on the hills to the north, east, and west. The geological formation is composed of igneous, unstratified rock; there are several granite quarries. The acreage is about equally divided between hilly and flat land, the village being situated in the lowest part. We have no swamp land; no stagnant water.

Phthisis. — This disease is not very frequent in my practice; have had five cases in two and a half years, all except one case being either in adjoining towns or brought here for care by friends.

I believe the *bacillus tuberculosis* to be the cause of phthisis. Am of the opinion that the more frequent predisposing causes are family history of phthisis, alcoholic excesses, bad hygiene, a peculiar delicacy of constitution and an inability to withstand disease. Next to an inherited tendency, think impure air is the most important predisposing cause. Causative diseases are often brought on by exposure to wet and cold or change from a dry to a damp climate.

Am of the opinion that the imperfect ventilation of school-houses has had much influence in causing the consumption of later life, especially when associated with the overwork of the young.

Can cite no cases that were positively induced by unsanitary conditions. A case of rapid phthisis developed in a girl of twenty years who had spent many nights in a skating-rink.

All cases under my observation have shown a family history of the same disease, which would seem to indicate its hereditary tendency. Have not seen the infectiousness of the disease especially illustrated, unless it be suggested by the death of a daughter from acute tuberculosis, she having for a long time slept with her mother who had chronic consumption.

To prevent the spread of the disease should advocate the disinfection of the sputa and dejections and then burying them; would forbid the marriage of persons in consumption; care to

secure pure air and drinking-water; food free from disease; cleanse the sickroom as after diphtheria. Think isolation of the patient is not necessary if proper sanitary measures are taken. Would thoroughly disinfect the sputa and allow none to dry in the room. (In a case which I have at present, 1890, I think the disease extends down the digestive tract, and the vomitus and feces are treated like the sputa.)

In families having a hereditary tendency to develop or acquire the disease would recommend change of climate, outdoor life, mild chest exercise. The general health should be kept in the best possible condition.

Have never observed a complete recovery from the disease.

In cases that do not admit of change of climate would recommend, if in doors, a change of occupation, plenty of good food, chest development in the open air, restriction in the use of alcohol and tobacco.

As general measures for the restriction and prevention of phthisis would recommend better drainage, especially in thickly settled localities; would forbid the manufacture and sale of intoxicating drinks as a beverage, thus reducing poverty; the formation of societies for the promotion of good marriages and the prevention of bad ones; better inspection of tenement houses by health officers.

Canaan — Grafton County.

B. E. Willey, M. D.

Topography. — The soil is very sandy as a rule. Should say that the hilly land predominated largely; very little swamp land; little or no stagnant water.

Phthisis. — Cases of pulmonary phthisis are not very frequent in my practice. I believe the *bacillus tuberculosis* to be the cause of the disease.

In my opinion the more frequent predisposing causes are: 1. Constant exposure to other cases of phthisis; 2. A system debilitated from other causes; 3. Improper hygiene.

Improper ventilation and dampness have little to do with the causation of the disease, in my opinion, except when taken in connection with direct exposure to the disease itself.

Cases illustrating the hereditary tendency or the infectiousness of the disease have not come under my observation.

Would recommend, as sanitary measures, good ventilation, large room in which the patient may be properly isolated, and perfect cleanliness as regards the patient and his surroundings.

Would isolate the patient as far as possible while indoors, and forbid his sharing his sleeping-apartment and bathroom with another person.

Would recommend the disinfection of the sputa, clothing, and surroundings.

As protective measures for families with a hereditary tendency to develop or acquire the disease, would recommend good air and plenty of it; good food; outdoor exercise; a separate sleeping-apartment for each person if possible; strict avoidance, as far as possible, of actual cases of the disease, especially advanced cases.

Have never observed a recovery from the disease.

In order to reduce the large mortality from phthisis, would advocate: 1. First of all, disinfection of the sputa; 2. Isolation of actual cases to prevent spread of the disease; 3. Building up of patients by good tonics, good air, cleanliness, and proper exercise.

CLAREMONT — SULLIVAN COUNTY.

A. R. CUMMINGS, M. D.

Topography. — The soil is composed of gravel and loam; the geological formation is mostly slate, some granite. We have more hilly than flat land, and no swamp lands. The town is situated between the Green and the White mountain ranges. We have no stagnant water. The Sugar river flows through the center of the village and has six or eight falls in that distance. The west bank of the Connecticut river forms the western boundary of the town.

Phthisis. — Cases of pulmonary phthisis are not very frequent in my practice. I believe the *bacillus tuberculosis* to be the cause of the disease, while imperfect nutrition may be a frequent predisposing cause.

I believe that imperfect ventilation has much to do with the causation of the disease, but bad ventilation of schoolhouses has had no particular influence upon it in this town.

Have known whole families to be carried off with phthisis, which would seem to indicate its hereditary tendency, but at this moment do not recall anything to illustrate its infectiousness.

All hygienic measures are to be recommended to prevent the spread of the disease. As far as practicable would isolate tuberculous patients, and by all means disinfect the sputa.

Particular attention should be given to increase nutrition in families with a hereditary tendency to the disease.

During my forty years of practice have seen several cases of complete recovery from the disease; some — a few — with vomica in lungs.

For those who cannot secure a change of climate, recommend open-air exercise, horseback riding, and camping out. These practices, together with isolation, proper ventilation, attention to hygiene, would tend to restrict the disease.

Several cases of advanced phthisis have been sent here from the east coast of Massachusetts, during the past thirty years, by physicians who recommended Claremont as a favorable location for consumptives.

Colebrook — Coös County.

C. C. NORRIS, M. D.

Topography. — The soil is a dry, sandy loam; the geological formation is disintegrated rock. Not much swamp land; mostly hills and flat bottom lands. Scarcely any stagnant water.

Phthisis. — This disease is not very frequent in my practice. Believe that in many cases the *bacillus tuberculosis* is the cause of the disease. Am of the opinion that heredity, dust from sputa, and occupying the sleeping-room with a consumptive are among the more frequent predisposing causes of pulmonary phthisis.

Imperfect ventilation of schoolhouses has probably not had much influence in the causation of consumption, although it should be regarded as detrimental to health.

To prevent and restrict the disease a large amount of common sense is necessary. Care should be taken of the person and weak lungs protected against cold weather and sudden changes.

Would isolate the patient so far as to have him use separate utensils and occupy a sleeping-room by himself. Would recommend that the sputa be burned.

Families with a hereditary tendency to the disease should pay particular attention to cleanliness and care of the person.

Concord — Merrimack County.

G. P. CONN, M. D.

Topography. — The soil is generally sandy, with clay subsoil. The geological formation is granite, covered with diluvial detritus of granite sand and loam. The highlands have a considerable extent of hardpan subsoil. The surface is uneven, though it presents none of the abrupt acclivities or deep valleys common in many New Hampshire towns. There is a considerable extent of interval and plain land; very limited extent of swamp and little stagnant water.

Phthisis. — Cases of pulmonary phthisis are common in my practice. Am not positive whether the *bacillus tuberculosis* is the cause or an effect of pulmonary phthisis; it is undoubtedly present.

In my opinion the more frequent predisposing causes are dampness, poor ventilation, bad or insufficient food, combined with a predisposition to disease. Both imperfect ventilation and dampness have a powerful influence in its development, in the fact that they depress the vital forces, and the system presents, therefore, less resistance to any form of disease. The effect of being confined in an unventilated schoolhouse is the same as is produced by similar conditions in any other building. When an individual is predisposed to phthisis, unsanitary conditions act with great force in depressing the vitality of the tissues usually affected by the disease, and it is quickly developed.

A great many instances may be recalled where generation after generation has been attacked with phthisis, until the family name has disappeared.

As sanitary measures to prevent the spread of the disease, would recommend isolation as far as possible, never allowing any one predisposed to the disease to be associated with those ill with it. As early as possible would remove tuberculous patients to a dry atmosphere and allow them to live out of doors. Would isolate such patients as far as practicable, and it is certainly a safe practice to disinfect the sputa.

Would advise families with a hereditary tendency to develop or acquire the disease, to leave New England as soon as possible. The children of such families should leave before they are ten years of age.

Have known some bad cases that have apparently recovered after removal to an elevated district with a dry atmosphere. Have known patients with only one lung to live several years.

Tuberculous persons should remove as far as possible from swamps and a clay subsoil, live as much as possible out of doors; in this State, I believe the higher mountains give the driest atmosphere and that which is best for such invalids.

I do not know that any practical measures can be suggested at the present time to reduce the mortality from this disease, as social, moral, and legal problems would have to be solved before much can be accomplished, — and this would be looked upon as interfering with civil rights.

J. FRANCIS BOTHFELD, M. D.

Phthisis. — My residence and experience in New Hampshire have not been of sufficient length to warrant my making out a report on phthisis, therefore I inclose the blank untouched. From past observations in Massachusetts and New York, not alone clinical, but more especially from laboratory research, I have not the least doubt that the bacillus is the exciting cause of tuberculosis.

GEORGE COOK, M. D.

Phthisis. — Cases of pulmonary consumption are comparatively frequent in my practice. We find the *bacillus tuberculosis* in most cases of phthisis, but that does not prove that it is the cause; it may be the result. I think this is still an open question.

In my opinion the more frequent predisposing causes are heredity; anything that lowers the powers of life; mal-nutrition first, and this may result from any unhealthful influence, i. e., mal-nutrition may result from improper food, both as to quantity and quality; prolonged exposure to cold and dampness; breathing impure air.

It is my impression that nearly every case coming under my observation has had a family history of the disease. As sanitary measures, instruction should be given in proper diet, quantity, quality, and manner of preparing it, and in all the laws of health.

Would isolate the patient to the same extent as in any disease not surely contagious. Would disinfect the sputa and all excrement.

Am doubtful if a true case of phthisis can permanently recover; it may be abated or held in check for a time.

EDWARD FRENCH, M. D.

New Hampshire Asylum for the Insane.

My experience has been almost entirely in asylums for the insane, where consumption is quite prevalent and is interchangeable with insanity, hence local influences of topography and climate are of little importance, for the disease is either present with the patient on admission, or it takes the place of insanity after admission.

Phthisis. — Cases of pulmonary phthisis are very frequent in my practice. In conjunction with hereditary weakness or tendency to phthisis, I believe the bacillus of Koch to be the cause of tuberculosis.

In my opinion the more frequent predisposing causes are hereditary weakness or tendency to phthisis, climatic influences, mal-nutrition, irritating substances inspired into the lungs, and insanity.

Have had no experience with imperfect ventilation, dampness, or unsanitary conditions in connection with the disease.

In regard to the hereditary tendency of the disease, I have access to many records of families in which phthisis seems to be transmitted from generation to generation, and very many cases where insanity takes the place of phthisis, and many times where

there is nothing to account for the insanity of the individual but a strong hereditary tendency to phthisis. There is such an accumulation of evidence on this point that it is accepted as a fact by asylum physicians.

I believe phthisis to be mildly infectious, and I have known a nurse, without any hereditary tendency, to contract the disease from a patient, but I think he was not in robust health — due to overwork.

As a sanitary measure to prevent the spread of the disease I would recommend rigid disinfection.

If there is no tendency to phthisis or insanity in the family, I do not believe isolation to be absolutely necessary, if intelligent disinfection is thoroughly employed. If this is not possible, I believe in isolation. Would always disinfect the sputa.

Families in which there is a hereditary tendency to develop or acquire the disease, should remove to a high, dry climate, like Southern Colorado or the plateaus of Northern New Mexico. Intelligent exercise and life in the open air are good protective measures.

I have never observed complete recovery from the disease, nor do I expect it in the class of cases with which I deal. I have seen partial recoveries, and cases in which the changes in the lungs seemed to be arrested for a time and the insanity of the individual assume a more active type; and *vice versa*, I have seen insanity give way to phthisis.

Where a change of climate cannot be secured, would recommend intelligent exercise, life in the open air, proper clothing and food, good hygiene, and every means to proper living and building up the whole system.

I believe that hospitals should be established for the treatment of that class of diseases commonly called "consumption." In such an institution artificial climates could be maintained and it would be possible to employ apparatus too expensive for use in general practice. Besides these advantages, proper nutrition, intelligent disinfection, and the latest advances in the treatment of such cases could be secured. It would remove sources of contagion from the community and family, and the disease is so mildly contagious that with proper means this source of danger

could be readily overcome. I believe the time is coming when the catarrhal and tuberculous forms of lung disease will be successfully cared for and perhaps cured in well-equipped hospitals.

Contoocook — Merrimack County.

J. W. WILSON, M. D.

Topography. — In the valleys the soil is loam; on the plains, sand; upon the hills, fertile soil with hardpan. The hill land predominates. No stagnant water.

Phthisis. — Cases of this disease are not frequent in my practice.

Do not believe the *bacillus tuberculosis* to be the cause of the disease. Tuberculous patients should not expectorate upon cloths, and all vessels should be emptied frequently, in order that the sputa may not become dried. In my opinion the more frequent predisposing causes of the disease are neglected catarrhal colds. Think a small proportion of the disease is due to imperfect ventilation; dampness is favorable to its development.

Have not known unsanitary conditions alone to cause the disease; but improper food and mental anxiety, combined with unsanitary conditions, may lead to it.

Have observed that if parents are consumptive, the offspring are more liable to the disease.

As sanitary measures, would recommend proper ventilation, nutritious diet, and proper clothing.

The tuberculous patient should room alone, and the sputa should be disinfected. For families with a hereditary tendency would advise a life in the open air, nutritious diet, and proper clothing.

Think I have observed complete recovery from the disease.

Conway — Carroll County.

S. A. EVANS, M. D.

Topography. — The soil is dry, sandy, and gravelly, except in the proximity of the Saco river, where there are broad intervals of alluvial soil which is moist and occasionally overflowed by the river. A sediment is deposited during an overflow which con-

sists of fine mineral matter, with a very slight admixture of organic substances. The geological formation is drift, consisting of sand, gravel, and bowlders, with occasional clay beds overlying granite, gneiss, and syenite. The phenomena of glacial action predominate. About two thirds of the surface is hill land, one third flat; no swamps, or next to none; no stagnant water.

Phthisis. — Cases of pulmonary phthisis are very rare in my practice. With my present light on the subject, I cannot resist the belief that the *bacillus tuberculosis* is the cause of the disease. Am of the opinion that the more frequent predisposing cause may be a certain condition of the organism which offers a fertile soil for the bacillus and which may be hereditary or acquired. Think the disease is much more due to foul air than to dampness. The improper ventilation of schoolhouses may be among the remote causes.

I have known — say a quarter of a century ago — several families in which all or nearly all died of what seemed to be hereditary phthisis; but latterly, either because those families have all died off or for some other reason, isolated cases are very rare in this region, and hereditary or family cases still more rare. I cannot now call to mind a case of phthisis within ten miles of my residence.

To prevent the spread of the disease, measures sufficient to destroy its germs should be adopted. If due care is observed to disinfect all bearers of germs and all places where they might be harbored, strict isolation of the patient would be unnecessary. Would disinfect the sputa.

Persons having a hereditary tendency to the disease should avoid contact with tuberculous persons, and should maintain their general health at the highest possible point.

Have never known a complete recovery from phthisis.

Those consumptives who cannot secure a change of climate should secure pure air, take moderate exercise, and maintain the healthy performance of all vital functions as far as possible.

As general measures to reduce the mortality from this disease: 1. Provide a long line of healthy ancestors; 2. Attend carefully to the general health; 3. Avoid contagion.

Dover — Strafford County.

CARL H. HORSCH, M. D.

Topography. — The soil is composd of sand, gravel, and clay; a good proportion of the land is arable. Geological formation is granite and alluvial strata. The surface is mostly hilly, with some flat and swamp lands. Some stagnant water on the south-east and west sides of the city.

Phthisis. — During forty-two years practice in medicine, six in Germany and thirty-six in the United States, have treated several hundred cases of the disease. The *bacillus tuberculosis* has been demonstrated to be the cause of phthisis by more reliable scientific research and investigation than has any other assumed cause. In my opinion, the more frequent predisposing causes of the disease are, descent from weak, consumptive, or syphilitic parents; living in poorly ventilated rooms; insufficient air-space; irregularity of diet; extreme changes in temperature; exposure to cold, with insufficient clothing; occupying rooms with consumptive patients, whose sputa becomes dried and is disseminated in the dust of the rooms; eating meat and drinking milk from tuberculous animals. I think imperfect ventilation plays a larger part than dampness in the causation of phthisis.

As to the imperfect ventilation of schoolhouses, a sufficient quantity of pure air is the most important immediate food necessary for animal life. If an individual be deprived of this for several hours daily for several years, predisposition to and development of consumption are likely to occur in later life.

Unsanitary conditions, such as living in crowded houses, damp cellars, poor ventilation, etc., have been factors in many cases treated, also in those seen in hospitals.

I cannot recall a case that would certainly prove that the disease was inherited, but I think there may be a hereditary tendency to the acquirement or development of the disease. I have observed that condition in a number of cases.

The case of a strong, healthy wife, with no hereditary tendency, who developed tuberculosis after the death of her husband with the disease, would seem to indicate that the disease is infectious.

To prevent the spread of the disease would recommend good

ventilation, cleanliness, protection against changes of temperature, sufficient rest, guarding against excesses, disinfection of the sputa of tuberculous patients, and isolation as far as circumstances will permit.

As soon as it is ascertained that the sputa of a patient contains bacilli, he should have his own eating and drinking utensils; he should sleep alone in a well-ventilated room, and take his meals by himself; his towels, sponges, etc., should be used by no other person; he should use a spit-box containing a disinfectant, and it should be often cleansed; and all contact, as kissing, etc., should be avoided. I should certainly recommend disinfecting the sputa.

Families having a hereditary tendency to the disease should seek a change of climate and observe all known sanitary measures.

Have never observed a complete recovery from phthisis; there may be some cessation. *Post mortem* examinations have revealed indurations of tubercular deposits in persons who have died of other diseases; have observed similar conditions in the lungs of butchered animals.

For tuberculous patients who cannot secure a change of climate, would advise, aside from medical treatment, strict adherence to hygiene, and all measures recommended by boards of health, health associations and physicians, for the promotion of good health.

As general measures to reduce the large mortality from this disease, should recommend good nourishing food, avoidance of all excesses, moderate and regular exercise, calisthenics and gymnastics, destruction of the bacilli wherever found, inspection of animals required for food before they are killed, and their organs and secretions *post mortem*, microscopic and chemical examination of milk, healthful homes, and hospitals exclusively for tuberculous patients.

M. C. LATHROP, M. D.

Phthisis. — Cases of this disease are not very frequent in my practice. I believe the *bacillus tuberculosis* to be the cause of phthisis. Believe the more common predisposing causes to be: 1. Heredity. 2. Whatever reduces constitutional vigor, and thereby lessens its power of resistance to the specific cause.

Imperfect ventilation and dampness are always unheathful conditions, and they must be especially injurious during the period of childhood and growth. Their tendency is to induce catarrhal afflictions, and thus, as I believe, invite consumption.

I can give no cases that will unquestionably establish my belief that, indirectly, unsanitary conditions frequently lead to the development of the disease in persons who are congenitally predisposed to it.

The following cases would seem to indicate the hereditary tendency of the disease:

W. L. died at the age of seventy, of acute malarial disease. He was thrice married; had by first and third wives two children each, all of whom are now living, varying in ages from thirty-six to sixty-two. From these four children there have been six grandchildren, all, together with their ancestors, free from consumption. The second wife was from a consumptive family; she had four children, one of whom died in infancy from dysentery, the other three and herself died of consumption.

Was the following case due to infection?

Miss P. C., a teacher with previous good health, although from consumptive stock, developed the disease immediately after the death of an intimate friend for whom she had acted as nurse during his last illness with consumption.

To prevent the spread of the disease, I should recommend the disinfection of all infectious discharges. Should recommend the disinfection of the sputa.

Families having a hereditary tendency to the disease should adopt the healthiest general mode of living attainable.

Have observed cases of apparent recovery from the disease, but in such cases have subsequently changed my diagnosis.

To reduce the large mortality from the disease, would recommend celibacy, more or less complete, of the congenitally predisposed.

Effingham — Carroll County.

ALBERT N. GOULD, M. D.

Topography. — The soil is composed chiefly of debris of granite, sand, and loam, with hardpan of iron-carbonate underlying. The geological formation is the primitive rock. Toward the

west and southwest there are sandy plains, covered with hard pine chiefly. Green Mountain, 1,950 feet above the level of the sea, occupies nearly the central part of, and is wholly within, the town. Average height of inhabited land above the sea level, 1,500 feet. The surface is hilly, but a bird's eye view gives a general appearance of an extensive valley at the foot of the mountain. There is relatively but little stagnant water. The southern and eastern sides are drained pretty effectually by South river, which has as tributaries clear trout streams from the mountain.

Phthisis. — For the past five or six years cases of phthisis have, for some reason, been less common than formerly; I can scarcely say why.

It is a question in my mind whether microscopic life is not the result rather than the cause of the unfavorable condition of the subject. Probably they extend the diseased condition in lung and other tissues when once a foothold is obtained. In my opinion, the more common predisposing causes are insufficient diet; overwork, especially in impure air; want of sufficient exercise in pure air. Conditions that are mentally or physically depressing seem to favor its origin. I have noticed, too, that young married women whose husbands have been affected with gonorrhea often develop the disease, though I do not understand what the connection is; and, lastly, contagion.

Pure air, and exercise in pure air, are imperative necessities for those predisposed to consumption. As to dampness, I think the best possible health can scarcely be sustained by any one living in a damp, imperfectly ventilated habitation. Sensitive lungs respond unfavorably to a cold, damp atmosphere.

The result of imperfectly ventilated schoolhouses may be better observed in cities than in the country. Nearly all my cases have occurred under fair to good sanitary conditions, — that is, so far as ventilation, drainage, etc., were concerned.

I have not as yet observed anything that would indicate the infectiousness of phthisis; nevertheless, would advise rational care and caution in regard to the sputa and the air of rooms occupied by phthisical patients. I consider the extermination of the disease among cattle, especially among milch cows, a good

move, and hope the inspection of herds and also of milk will be rigidly enforced by stringent laws.

If the sputa of tuberculous patients be disinfected and burned, and particular care be given to cleanliness of patients and their surroundings, I would hardly advise the isolation of the patient. I should certainly advise the disinfection of the sputa, or, at least, use old cloths and immediately burn them.

Families having a hereditary tendency to phthisis should give special attention to exercise in the open air, should have nutritious food, wear woolen underclothing at all seasons, keep the extremities at all seasons warm and dry, and avoid long-continued exposure to severe cold and sudden chills.

Once only have I observed a recovery from the disease.

For tuberculous patients who cannot secure a change of climate, long hours of sleep, pure air, exercise that does not unduly fatigue, cheerful thoughts, and the avoidance of anything that depresses body or mind will be most beneficial.

To reduce the large mortality from this disease, would recommend the destruction of all infected animals, rigid inspection of milk and meats, and, finally, that which will never be, a state of society in which thousands of people shall not be overworked on a meager and insufficient diet.

J. M. LEAVITT, M. D.

Phthisis. — Cases of this disease are not very frequent in my practice. I believe that the *bacillus tuberculosis* is the cause of pulmonary phthisis. In my opinion, the more frequent predisposing causes are hereditary diathesis and depressing influences. Of seventeen deaths from consumption in my practice of twelve years, thirteen could be traced to heredity without doubt. A very small part were due to imperfect ventilation or dampness. In my opinion, thirteen of my cases prove the hereditary tendency of the disease.

I have a patient who is of the opinion that she contracted the disease while sleeping with and caring for her consumptive sister some six years ago.

" Early to bed and early to rise " is especially applicable here as a sanitary measure ; also plenty of nourishing food and out-

door exercise, agreeable occupation for mind and body, contentment; occupy a separate sleeping-apartment always, keep the skin active by friction, etc. I would isolate the patient to the extent that no one should breathe his respired air, and his clothing and utensils should be washed by themselves. I would burn the sputa and thus be entirely rid of it.

Families with a hereditary tendency to phthisis should seek a dry climate, keep vigorous in mind and body, and avoid all sexual excesses.

Have never observed a complete recovery in a well-marked case of phthisis. Tuberculous persons who cannot secure a change of climate should observe prudence in eating, drinking, and sleeping, aside from medical treatment.

Persons with a phthisical diathesis should never beget or bear children, as such offspring are almost certain to develop the disease sooner or later. If this were observed, the mortality from the disease would be greatly lessened.

Epping — Rockingham County.

A. W. MITCHELL, M. D.

Topography. — The soil is generally good. Three rivers traverse the town and furnish some good water power. In the East village the surface is low, level, and the soil sandy; at the chief village it is rather low, and almost clear clay, so that millions of brick are manufactured yearly; at the West village the surface is hilly and rocky. We have considerable stagnant water.

Phthisis. — This disease is not remarkably prevalent in my practice, except at the county institution at Brentwood, where many drift in in the last stages of the disease.

Am of the opinion that the *bacillus tuberculosis* is the cause in a majority of the cases, but think it is not absolutely necessary in the possibly several diseases we call "phthisis."

Consider the more frequent predisposing causes to be heredity, improper clothing of ladies and children, too little pure outdoor air, decaying vegetables in damp cellars, inhaling the dust that arises in various occupations, and debility from any cause.

The effects of imperfect ventilation are more noticeable in cities, while in rural districts dampness is a more prominent factor

—usually in the shape of a frog pond. Unsanitary conditions have a very bad influence upon children and the feeble.

As to the hereditary tendency of the disease, I observed a child, born of a strong, healthy mother, but whose father had suffered amputation of the thigh on account of tuberculous disease, and who had well-advanced pulmonary phthisis, who died at eight months of age of well-marked *tuberculosis pulmonalis*, and, as I believe, of general phthisis also.

My aunt died of phthisis, after having been married eight years to a man of robust health with no hereditary tendency. Eighteen or twenty months later he died of the same disease, which ran a course much like her illness. I saw no explanation other than infection.

As sanitary measures to prevent the spread of the disease, would recommend that, if well-water must be used, the closets, sinks, stables, etc., be drained elsewhere than into the well; that carpets and wall-paper be abolished; that the sputa be disinfected and floors sprinkled before sweeping; that the infected sleep alone, and in well-ventilated rooms; that meat, milk, and cows be intelligently inspected.

Would isolate tuberculous patients as far as consistent with their comfort and the safety of other people. Would recommend the disinfection of the sputa.

Persons with a hereditary tendency to the disease should develop the chest by exercise in the open air, maintain the weight and the vital forces at the highest point, cultivate a taste for fats, avoid night, damp, and dusty air, always have woolen clothing next the skin, wear good shoes, and live in a dry, healthy place.

Have been convinced by work in the dissecting-room, and at *post mortems*, that there may be complete recovery from the disease.

Tuberculous patients who cannot secure a change of climate should occupy the brightest, best rooms in the house, live out of doors in good weather, ride, especially horseback, and nourish the body to the fullest extent.

To reduce the large mortality, would educate the people in regard to the nature, development, and prevention of phthisis. Would have active, bold, and intelligent boards of health, plenty

of legislation, and see to it that every duty was performed by each and all.

FITZWILLIAM — CHESHIRE COUNTY.

O. H. HUBBARD, M. D.

Topography. — The soil is of granite formation, naturally strong, as shown by the heavy growth of timber. Stones and rocks are abundant. The surface is uneven and the soil hard, but suitable for grazing. The spur of Monadnock Mountain upon which the town is located is 1,150 feet above sea level. About nine tenths of the acreage is hill, and the remaining one tenth is about equally divided between swamp and flat land. There is very little stagnant water.

Phthisis. — The disease does not prevail to any great extent in my practice. For the year ending August 1, 1890, of twenty-two deaths in town, three were from pulmonary phthisis, and one of these was imported.

I believe that the *bacillus tuberculosis* is the cause of the disease. Believe the more frequent predisposing causes to be a hereditary weakness of the constitution; over-crowded, poorly ventilated, filthy houses; employment at occupations which cause the inhalation of irritating particles, as stone-cutting, polishing, etc., and living in low, damp localities. Imperfect ventilation, by lowering the vital forces, renders the system a suitable soil for the bacilli. Dampness, by its production of bronchial troubles, produces a favorable entrance for the bacilli.

Think the imperfect ventilation of schoolhouses may have an influence in the causation of the disease, although have never seen a case that could be directly attributed to this.

Unsanitary conditions have had no connection with the cases in this locality; but in my hospital note-book I find a few cases with unsanitary surroundings marked as the cause, but cannot give particulars.

Have had several cases with a family history of the disease, although in some cases there have been other predisposing causes.

As sanitary measures to prevent the spread of the disease would recommend that all sputum be received in a cup and properly disposed of; thorough cleansing of walls and furniture, and often

wiping with damp cloth ; all dishes and other utensils used by patient to be washed in boiling water before being used by another person ; all clothes and apparel of patient to be cleansed in boiling water. Would isolate tuberculous patients to the extent that each should have separate sleeping-apartments and that no other person should occupy them for sleeping purposes. Would disinfect the sputa.

Families having a hereditary tendency to phthisis should seek a residence in a high, dry climate, should pursue outdoor occupations as much as possible, and should secure the thorough ventilation of dwellings and have plenty of nutritious food.

Have observed complete recovery in the early stages of the disease. Patients who cannot secure a change of climate should give strict attention to the hygiene and nutrition of the body, and the development of the chest and respiratory organs by exercise and gymnastics if necessary.

As consumption itself is so terribly fatal a disease, prevention seems to be the only means of reducing the mortality. The people should be enlightened in regard to the nature of the disease and instructed in the best methods of caring for phthisical patients, so as to best protect those who are exposed.

Gilsum — Cheshire County.

I. A. LOVELAND, M. D.

Topography. — The soil is mostly rocky, although fine arable land is to be found, free from stone. The surface is mostly hilly, with a little flat and still less swamp land. No stagnant water.

Phthisis. — Pulmonary phthisis is not common in my practice.

To my mind the weight of evidence now produced tends to show that the *bacillus tuberculosis* is the cause of the disease. Am of the opinion that the more common predisposing causes are lack of fresh air and physical exercise in it ; also anything that lowers the tone of the system predisposes to the disease. Both dampness and imperfect ventilation play a part in the causation of phthisis.

Think the imperfect ventilation of schoolhouses has had much to do with causing the consumption of later life, and not only

that, but the high-pressure system of education pursued in many of our schools is a more frequent cause, especially in girls.

HANCOCK — HILLSBOROUGH COUNTY.

EUGENE WASON, M. D.

Topography. — The immediate village is situated on a sand plain of unknown depth, — hundreds of feet at least. The country outside is heavy loam with gravel subsoil.

The rock is principally conglomerate and granite, with plumbago and iron in various places. The surface is nearly all hilly and mountainous; perhaps one twentieth part of the acreage is flat and swamp land. No stagnant water of any account.

Phthisis. — This disease is almost unknown in this locality. Have been here five years and have had but one native case that I can recall, and that took the form of tubercular meningitis. Cases come from abroad during the summer, and receive comfort by so doing.

Do not believe that the *bacillus tuberculosis* is the cause of the disease in the sense of its being actively infectious. It may be the exciting cause where inoculated in the lower animals; but in a large experience with the disease, in former years, I have never met a case which I thought was produced by contact with an already developed case.

In my opinion, hereditary taint is, above everything else, the predisposing cause. In a certain town in this State, where there are more cases per 1,000 inhabitants than in any other place within my knowledge, the families have intermarried since its first settlement, over and over again, until they are nearly all of one family and nearly all have scrofula in some form.

Think neither imperfect ventilation nor dampness will produce the disease if the germs are not latent in the system. Think the imperfect ventilation of schoolhouses has not had much influence in causing consumption, unless there has been a family predisposition in connection therewith.

Unsanitary conditions may be the exciting cause, but not the primary, so far as my observation extends. My case-book relating to the disease in the town above referred to was recently burned, so I am unable to cite cases to illustrate the hereditary

tendency of the disease, but I could give you the names of many families there in which it would be profitable to trace the disease in connection with intermarriage.

Have never observed anything to indicate that the disease is infectious.

In all tainted families the castration of the males and ovariotomies of all females would prevent the spread of phthisis. This may seem rather radical, but it is the only measure that will ever stamp out tuberculosis or insanity.

Would recommend the isolation of tuberculous patients to the extent of comfort to the patient and family. Think it would be well to disinfect the sputa, on account of the lower animals.

Have never seen a complete recovery from the disease, and never expect to. Would advise patients to get the most comfort and enjoyment that they in any manner can, — and remain where they are. I have rarely seen benefit from change of climate.

After many years intimate acquaintance with the disease, I have nothing further to recommend that would reduce the large mortality from this disease.

Hanover — Grafton County.

WILLIAM T. SMITH, M. D.

Topography. — The nature of the soil varies from clay to sand, granite underlying; very little swamp land, and most of the meadows are on hills or high levels; no stagnant water.

Phthisis. — Cases of phthisis are relatively frequent in my practice. Believe the *bacillus tuberculosis* to be the cause of the disease. Among the more frequent predisposing causes are heredity, insufficient or indigestible food, overwork, confinement in ill-ventilated rooms, as well as all other non-hygienic conditions that lower vitality. Imperfect ventilation and dampness favor its development.

The imperfect ventilation of schoolrooms doubtless has some influence in developing the consumption of later life, but active children get a great deal of oxygen out of school hours in the country districts.

F. I know of a woman whose father and four uncles died of consumption; of her eight brothers and sisters, five died of consumption, and of her seven children, five died of consumption. This would seem to illustrate the hereditary tendency of phthisis.

The disease would appear to have been infectious in the following case: A young woman married a man who died of phthisis, and she died two months after of the same disease. She was strong and well at the time of her marriage, and there was no trace of phthisis in her family. She was one of six children, all of whom were well and strong.

As measures to prevent the spread of the disease, would recommend the absolute disinfection of the sputa of tuberculous patients, care that no dried sputum remains on the linen, or elsewhere, sterilize the milk given to bottle-fed infants, careful inspection of cows to keep tuberculous milk out.

The danger from tuberculous patients arises from close and continued confinement with them, in sleeping with such a patient, or in occupying the same apartment day and night. Avoid this as far as possible. Would disinfect the sputa.

Families having a hereditary tendency should seek a residence in a favorable climate, live an outdoor life, avoid excesses of all kinds, dress properly, and secure good sanitary conditions in the dwelling, dry cellars, good ventilation, etc.

Have never observed a complete recovery from phthisis. For tuberculous patients who cannot secure a change of climate, would recommend outdoor air, sufficient exercise, daily bathing, good, plain food, regular habits, woolen underclothing of a weight suited to the season, avoidance of exposure to extreme bad weather, and abstinence from alcohol and tobacco.

As general measures to reduce the mortality from this disease, would emphasize the fact that phthisis is a contagious disease, induce physicians to believe it, and act accordingly. Would use any legitimate influence against intermarriage of phthisical families. Encourage the removal or those especially liable to it to more favorable regions than New England.

C. P. FROST, M. D.

Phthisis. — This disease is not very common in my practice. I am strongly inclined to the belief that the *bacillus tuberculosis* is

the cause of phthisis. Anything that materially lowers the vital power of resistance to disease, especially any previous disease that implicates the respiratory tract, has a predisposing tendency to consumption.

Impure air predisposes to disease, and to pulmonary disease especially, if the air is loaded with particles of dust of almost any description. Am of the opinion that the imperfect ventilation of schoolhouses has not had much influence in causing the consumption of later life.

To prevent the spread of the disease, would, as far as possible, remove everything tending to lower the vital powers of resistance, and maintain the general health at the highest possible standard.

I am not ready to recommend the isolation of tuberculous patients, but would advise the disinfection of the sputa.

Have observed complete recovery in this disease.

As general measures to reduce the large mortality from phthisis, as well as from other diseases, would recommend that the body be properly protected, nourished, and exercised; banish from the world all sin and ignorance; bring in virtue, knowledge, the ability to do all that should be done and to avoid that which ought not to be done. Aim high, and do not be too much discouraged if you never hit the mark. Doctors will be required for several years yet. There will be need of sanitary instruction as long as men exist, probably, as well as for medical care and treatment.

Henniker — Merrimack County.

GEORGE H. SANBORN, M. D.

Topography. — The surface of the town is broken, a chain of hills extending on the south and west sides, and on the north and east sides are plateaus. A rich alluvial soil on river lands, on the plateaus a heavier, porous soil, quick to absorb moisture, while on the highlands the soil is thinner. Good pasturage. Highest elevation, Crany Hill, 1,420 feet. The geological formation is granite and gneiss on all the more elevated portions; on the bottom lands, clay, blue and white, with sand between; on plateaus, till, or hardpan, with bed granite; some bowlders. A

rock blanket underlies the township. Five eighths of the acreage not covered by water is table and hilly land, the remainder pasturage and wood land; one quarter level and rolling; one eighth swamp land near ponds, having good drainage; one fifth of whole acreage covered by water. But very little stagnant water in the township.

Phthisis. — I should say that I have had, on an average, three cases of this disease a year for the past fifteen years; three cases so far this year, and one death.

I do not believe that the *bacillus tuberculosis* is the cause of the disease in every case. We have consumption and consumption. I am of the opinion that the *bacillus tuberculosis* is the cause of the disease in those cases of inherited tendency or "soil."

In my opinion, the more frequent predisposing causes are, first, heredity; any foreign substance in the air-passages. The clot of blood retained after hemoptysis caused the disease in four of my cases; a severe cold, causing cough, was followed by consumption in four cases, and the exudation of pleurisy caused the disease in two cases.

Persons inheriting a certain "soil," either tuberculous or scrofulous, do not possess the resisting power of the vigorous person, hence, in such cases, imperfect ventilation and dampness might lead to its development; on the other hand, in persons without this tendency they would not produce that form of consumption caused by the "germ."

If the imperfect ventilation of schoolhouses does not lead to the development of consumption immediately, I cannot see why it should cause it later in life. Bad ventilation is a source of many diseases, but we should expect to get immediate effects.

I cannot recall a single case caused by unsanitary conditions, nor can I see any relation between filth and this disease. In very many of my cases inherited tendency has been an important factor, the father and mother, or grandparents, one or both, having died of phthisis. My observation leads me to believe that the disease is neither infectious nor contagious (to man). I have seen it communicated to a cat, in one instance, the cat sleeping on the bed with the patient during his illness.

Would recommend the same sanitary measures as in typhoid fever to prevent the spread of the disease, viz., cleanliness.

As the disease is usually of long duration, isolation would be very inconvenient in many places, and, if the disease is not contagious, what good would be derived from it? Would recommend the disinfection of the sputa if a spit-cup is used, but, as I understand it, the sputa in the moist state is devoid of danger. I advise my patients to use cloths and old handkerchiefs, and to burn them immediately.

For families having a hereditary tendency, would advise moderate exercise in the open air every day in the year, forced inspiration and expiration, cleanliness, rooms well ventilated all the year round, wood fire, not coal, and good nourishing food. Avoid everything that tends to lower the resisting power.

I have had three cases of complete recovery, but there was no inherited tendency in any of the cases. One case was caused by exudation of pleurisy, clots of blood retained and acting as foreign substances in the other two. In my opinion, had the *bacillus tuberculosis* caused these cases, death would have been the result.

Very little can be expected in this disease from medication, in my opinion. Healthy parents beget healthy children; parents with hereditary taint, be it scrofula, cancer, syphilis, or consumption, produce children with like taints, or a "soil" liable to such disease, and such being the case, I can see but one thing to reduce the mortality from consumption, prevent the marrying of such, and future generations would show a marked decrease in the disease,— those cases caused by the *bacillus tuberculosis*.

N. W. BEAN, M. D.

Phthisis. — Deaths from phthisis average three a year in my practice. Am of the opinion that the *bacillus tuberculosis* is the cause of the disease. The more important predisposing causes are, perhaps, overwork, bad or insufficient food, imperfect ventilation, damp sleeping-apartments in old, tainted houses. Among children from nine to eighteen years of age, these conditions have a great influence. Do not think the imperfect ventilation of schoolhouses has had any part in the causation of consumption of later life.

I do not believe in the hereditary transmission of phthisis. The cases which appear to be so are, in fact, simply surrounded by the same conditions, and the source is, of course, the same.

Have known of cases occurring in a family where several other members did not have the disease, while the person who cared for the patients contracted phthisis, undoubtedly from the careless handling of the sputa.

To prevent the spread of the disease, would recommend that tuberculous patients be cared for by one person only, who should take daily exercise in the open air for three hours after sunrise and keep himself in good physical condition. The patient should use cloths for the reception of the sputa, and these should be immediately thrown into the fire. Free use should be made of antiseptics in every part of the sickroom, together with the free inhalation of some antiseptic; good food, and, above all, pure air day and night. By all means would recommend the disinfection of the sputa.

Jaffrey (East) — Cheshire County.

O. H. BRADLEY, M. D.

Topography. — The soil is sandy loam, dry. But little flat or swamp land; the surface is hilly or rolling. Very little stagnant water.

Phthisis. — This disease is very frequent in my practice, but a large proportion of the cases are from out of town. Phthisis is not especially frequent in this town.

I believe the disease to be the direct result of some specific cause, probably the *bacillus tuberculosis*. Believe an inherited predisposition to be the most common predisposing cause. The relation of imperfect ventilation and dampness to the disease depends upon circumstances; in this locality they have but little influence. Am not positive that I ever had cases that were due to unsanitary conditions. My observations in regard to the hereditary tendency of the disease are of a general character, and extend over a period of about forty years. Many cases might be cited to illustrate this point, but neither space nor time permits.

For more than thirty years I have regarded phthisis as an infectious disease. Have several times seen entire families wiped out by its relentless march. One marked instance occurred more than twenty years ago: A father, mother, and some five or six children, all previously healthy, died, one after the other, during

a period of about two years, with pulmonary consumption. Two remaining children, away from home, were not affected, and are still living and well.

To prevent the spread of the disease, look well after the general health and avoid exposure to its infection. The more complete the isolation of tuberculous patients, the safer for the community and friends. I would not recommend the disinfection of the sputa, I would recommend that it be burned every time.

Families having a hereditary tendency to the disease should take the best of care of their general health and absolutely avoid exposure to infection. Think I have observed complete recovery in cases of phthisis.

There are no general rules for tuberculous patients to follow, as there are so many conflicting conditions. If change of climate cannot be secured, it would be well to consult some level-headed physician and follow his advice.

The only practical course that would tend to reduce the mortality from consumption would be to prohibit (by legislation probably) the tuberculous persons from mingling with the general public.

Kingston — Rockingham County.

T. O. REYNOLDS, M. D.

Topography. — The soil is sandy, with a coarse gravel subsoil; the geological formation is granite and drift. The surface is mostly flat and undulating, very little hill toward the north and the south of the township. Considerable swamp land along the river. There is no stagnant water, except in summer, and then only along the Powow river, when the flowage is drawn off, leaving acres of stagnant water and mud.

Phthisis. — During the past ten years I have not had so many cases as prior to that time; perhaps half a dozen cases per year now.

I believe the *bacillus tuberculosis* to be the cause of phthisis, and, in my opinion, hereditary debility of the assimilatory organs is the most common predisposing cause. Sleeping or living in badly ventilated rooms daily increases the hereditary tendency to debilitated nutritive function. Do not think the imperfect

ventilation of schoolhouses has had much influence in causing the consumption of later life. I think I can safely say that in seven tenths of all the cases I have treated the development of the disease has been hastened by heedless neglect of proper air in sleeping or living rooms, or both.

Regarding heredity, in my opinion most cases can be traced only to heredity for their origin. I have but little doubt of the bacillus theory, and the infectiousness of the disease; but it is somewhat difficult to account for most cases as originating in that way.

The following case, to my mind, illustrates the infectiousness of phthisis: G. B., of Raymond, died of phthisis a few years ago. His wife, who took constant care of him, died in about a year of the same disease. There was never a trace of tuberculosis in her family, nor did she show the least sign of the disease prior to his death; I knew them all intimately.

Think isolation of the patient is unnecessary if proper care is taken of the sources of infection. Would disinfect the sputa.

For families having a predisposition to the disease, plain diet and outdoor life are to be recommended.

Have never seen complete recovery from this disease.

For tuberculous patients who cannot secure a change of climate, plenty of outdoor air is essential. Better stay out of doors all the time than in a badly ventilated room and fear "catching cold." The fear of "catching cold" shortens the life of most consumptives.

As general measures to reduce the mortality from phthisis, would educate the public in those branches of sanitary science relating to the danger of infection, and would emphasize the fact that air, pure and simple, was made to breathe, and that men should eat to live rather than live to eat. Luxuries, so-called, are responsible for much of the physiological debility which induces predisposition to disease.

Laconia — Belknap County.

A. Haven Harriman, M. D.

Topography. — About four tenths of the soil is field surface, mixed with clay; subsoil wet. Three tenths higher, sand soil with dry subsoil; good cellars. Three tenths hilly, much wet

subsoil. There is abundant evidence of glacial geological formation, modified by rain and water formation. About one sixth of the acreage is swamp land. Not much stagnant water.

Phthisis. — Pulmonary phthisis is frequent in my practice. From personal observation, I do not know that the *bacillus tuberculosis* is the cause of the disease, but from trustworthy accounts believe that it is. Am of the opinion that heredity and insalubrious surroundings are the more frequent predisposing causes. By heredity I mean that physical conformation and manner of living that are due only to inheritance, and which render the subject especially susceptible to the *bacillus tuberculosis* when introduced into the body.

Probably both imperfect ventilation and dampness act indirectly in the causation of the disease, and potently, too. Much more harm is done by imperfect ventilation than by dampness, for, if perfect ventilation obtains, dampness becomes of minor importance. Hence the danger of dampness is much influenced by the degree of ventilation.

Indirectly, the imperfect ventilation of schoolhouses has had much influence in the causation of consumption in later life.

Have had cases which were attributable, in my opinion, to unsanitary conditions: Male, aged thirty-five, married. Wife and family hygienically filthy and heedless of ventilation. Mother and sister died of consumption. The house, shed, and cellar were damp and filthy. His temperature for four months varied from 102° to 104° F. each evening, and he was much emaciated. For two weeks in July, 1886, he stowed hay in the loft of a hot and dirty barn each afternoon; soon became worse, and died in December, 1886.

The hereditary tendency of the disease is indicated by the following cases: A school girl, aged sixteen, has acute phthisis. Consumption in grandparent's family; two sisters and one brother died of the same disease; mother and father healthy. Mr. E., engineer, has chronic phthisis. His mother and three sisters died of consumption. Can relate many other cases of a similar character.

Believe the disease was due to infection in the following cases: In 1885 Miss A., aged eighteen, married, and immediately

assumed charge of her consumptive father-in-law. She died eight months after of pulmonary phthisis. There was no previous history of phthisis in her family and she had always been in good health. A husband, aged about thirty-five, took entire care of his wife, who died of phthisis. He died of the same disease in two years; was a very robust man, and had no history of phthisis.

To avoid the spread of phthisis the following sanitary measures are to be recommended: A cold or cool bath daily, outdoor life, proper food and clothing, pure air night and day, whether in Colorado or New Hampshire. Forbid the marriage of phthisical persons.

Would isolate tuberculous patients to the extent of having them occupy a room alone, and exclude children and young persons from them entirely. Would certainly recommend the disinfection of the sputa.

Think I have observed complete recovery in one case of phthisis; however, the diagnosis was not proven by the presence of the *bacillus tuberculosis*.

To reduce the large mortality from this disease, would educate the people in the care and culture of lung tissue, and give less attention to the education of the nervous system.

J. O. DUTRIZAC, M. D.

Phthisis. — In two years' practice I have had five cases of pulmonary phthisis. I believe the *bacillus tuberculosis* to be the cause of the disease. The hereditary character of the disease will always be the principal predisposing cause, and bad ventilation and dampness are also among the indirect causes.

We have three families in this vicinity, every member of which, sooner or later, develops consumption.

To prevent the spread of the disease, would instruct the people in regard to its character and the sanitary measures necessary in connection with it. Should advocate isolation of tuberculous patients; also the disinfection of the sputa.

In families having a hereditary tendency to the disease, would recommend perfect cleanliness and outdoor occupations.

Have never observed complete recovery in a case of phthisis.

To reduce the large mortality from the disease, I would impress

upon the people the contagious character of the disease and instruct them generally in regard to its character and the means to be employed for its prevention and restriction.

Lebanon — Grafton County.

JAMES A. DAVIS, M. D.

Topography. — The soil is sandy in the river valleys; mostly clay and marl on the hills. The geological formation is mainly mica slate, with granite on the middle of the north line of the township. About three quarters of the acreage is hill land, one quarter flat, and very little swamp. There are three small ponds within the township, but very little stagnant water.

Phthisis. — Cases of this disease are not so frequent in my practice as they were twenty years ago. I believe that the *bacillus tuberculosis* is the cause of pulmonary phthisis, and that impure air is one of the most common predisposing causes of the disease. Imperfect ventilation and dampness play an important part in the causation of the disease.

The imperfect ventilation of schoolhouses no doubt influences, to a certain extent, the development of the disease in later life.

One case certainly occurred amidst very unsanitary conditions, if, indeed, they were not the cause of the disease: A woman developed consumption while living in the upper tenement of a house. The dwelling was surrounded by three pig-pens and two privies. I ordered her to be removed from the locality, but she died within a few months.

Have had cases which seemed to be due to infection, but none during the past year. Improvement in sewerage and ventilation should be recommended to prevent the spread of the disease. Think it unnecessary to isolate tuberculous patients, but would certainly disinfect the sputa.

Pure air, nutritious diet, and exercise in the open air are to be recommended for families having a hereditary tendency to develop phthisis.

In one case only have I seen a complete recovery from phthisis.

LEMPSTER — SULLIVAN COUNTY.

J. N. BUTLER, M. D.

Topography. — The soil is fertile, and, by careful cultivation, is made to yield good crops. The surface is broken and uneven, the hills or swells between the valleys composing about seven tenths of the acreage, and having an underlying hardpan; the valleys, composed of a sandy loam, constitute about one fifth of the acreage, and one tenth is swamp land. There is but little stagnant water.

Phthisis. — Cases of this disease are not common in my practice. Fewer cases of phthisis originate in this town than in any other with which I am acquainted. Am of the opinion that the *bacillus tuberculosis* may be the cause of the disease. Unsound parentage, and whatever tends to impair the tone of the system as a whole, bad air, and improper food and clothing are, in my opinion, the more common predisposing causes of the disease. Imperfect ventilation and dampness are sufficiently influential in the causation of phthisis to be taken into consideration. Think phthisis may be infectious to a certain extent.

Would isolate tuberculous patients as far as practicable, and would disinfect the sputa.

Families having a tendency to develop the disease should take great care to improve the general health.

Think I have seen complete recoveries in cases of phthisis.

To reduce the large mortality from phthisis, would recommend pure air, appropriate food and exercise, and the immediate relief of any inflammatory condition.

LISBON — GRAFTON COUNTY.

C. H. BOYNTON, M. D.

Topography. — The surface is mostly hills and valleys. The soil in Lyme and West Bath is largely clay slate; in Lisbon and Landaff, deep clay loam, with hard subsoil; near the river, sandy loam, with gravel and cobblestone subsoil. The geological formation is largely clay slate; coarse granite appears on the tops of the high hills. There is very little flat land in this and adjoining towns; no swamps of any magnitude; no stagnant water.

Phthisis. — This disease is not common in my practice; occasionally have a case. I do not believe the *bacillus tuberculosis* to be the only cause of phthisis. I believe that certain conditions may develop the disease in a previously healthy person who has had no exposure to the *bacillus tuberculosis*. Anything that tends to lower the vital forces predisposes to disease, and slight exciting causes may induce some form of disease, which may develop during its progress the particular germ which characterizes it, and this may develop the same disease in others who may come in contact with such diseased persons, if their systems chance to be in a favorable condition to propagate the germ which they have received. Physical and mental overwork, impure air, especially badly ventilated sleeping-rooms, insufficient or unwholesome food, irregular habits of life, are undoubtedly predisposing causes of this disease, while sometimes slight inflammations of the lung tissues may prove a sufficient exciting cause to create and develop phthisis in those organs. I think bad ventilation a far more important factor in causing this disease than dampness, though a pure, dry atmosphere is preferable to a moist one.

Pupils who spend their youth in badly ventilated schoolrooms have less vigor, less power to resist various forms of disease in after life, and consumption is one of them.

Have never known a case of phthisis which could be attributed to unsanitary conditions, independent of other circumstances which would tend in the same direction.

There is doubtless a hereditary tendency in this disease, but in the cases with which I have been familiar, marked predisposing and exciting causes have been far more prominent. About twenty-five years ago a brilliant lady teacher returned to her home, which was in a high and dry locality in the town of Landaff. Her bodily health and nervous system were in a shattered condition, and for about a year she suffered from various disorders incident to such a state. Her vitality was being rapidly exhausted when, after a severe cold, cough developed, lungs, which had previously been in a healthy condition, became diseased, and in about another year she died of tuberculous consumption. I have no doubt the *bacillus tuberculosis* was present. Sanitary conditions good.

The family was composed of father, mother, three sons, and three daughters. Before her death another daughter became infected with the disease and before the end of five years the sons and daughters were all dead, and at the end of another year the father died also in the same manner. Here seems to have been development of the disease without hereditary tendency, or infection and propagation to an unlimited degree.

Think I have observed complete recovery in cases of this disease.

For tuberculous patients who cannot secure a change of climate, would recommend as much outdoor exercise as the conditions will permit without fatigue; good food; perfect sanitary surroundings inside and outside of dwellings.

To reduce the large mortality from phthisis, would cause sanitary science and the principles of hygiene to be made a part of our common school education. Distribute extensively among all the people such publications upon these topics as the average person can comprehend.

Popular lectures would do much toward interesting people in the subject, and they should be instructed what to do and how to do it in a plain practical way.

Littleton — Grafton County.

T. E. SANGER, M. D.

Topography. — There are all varieties of soil in this town. In the village, which contains fifty per cent of the population, there is a hardpan of compressed sand; on top of this are from two to six feet of gravel, with an upper stratum of from one to six feet of loam. Water percolates through the layer of gravel above the hardpan. About ninety per cent of the acreage is hill land, nine and three fourths per cent flat, and about two per cent swamp. We have no stagnant water.

Phthisis. — Cases of this disease are not very frequent in my practice now. Should say the disease has decreased at least sixty per cent in this town within the last thirty years. Theoretically, I believe the *bacillus tuberculosis* to be the cause of pulmonary consumption. Among the more common predisposing causes, should place hereditary tendency, poor or insufficient food, overwork, and too close confinement in poorly ventilated rooms.

Can recall some cases where both imperfect ventilation and dampness have seemed a factor; but cannot give an exact ratio of their influence.

In very many instances the imperfect ventilation of school-houses has had an influence in the causation of consumption in later life, in my opinion.

Should say that in about one half the cases treated by me, phthisis could be traced in one or both branches of the family. In numerous cases, wives who have nursed their consumptive husbands have died within two years after with the same disease, and *vice versa*. Mrs. C., ill with phthisis, was cared for at night by her husband, who developed a cough before she died. Two years after his wife's death, he married a healthy woman, who soon sickened, and died with consumption fifteen months after her marriage. About six months after her death the husband died with the same disease.

To prevent the spread of phthisis, would recommend a well-ventilated and thoroughly clean sickroom; perfect cleanliness of the bed clothing, the patient, and all his surroundings, and the disinfection and burning or burying of all excretions.

I would isolate tuberculous patients as far as compatible with good nursing. By all means disinfect the sputa.

Would recommend, as protective measures for families having a predisposition to the disease, flannels worn next the skin both summer and winter, good food and an abundance of it, exercise in the open air, freedom from care, and no night work.

Have never observed a complete recovery from this disease.

Londonderry — Rockingham County.

F. B. PERKINS, M. D.

Topography. — The soil is unusually fertile and easy of cultivation. There are no high hills, extensive plains, or swamp lands; the surface is varied by gentle swells and intervening vales; no stagnant water.

Phthisis. — Cases of this disease are not particularly frequent in my practice. I believe the *bacillus tuberculosis* to be the cause of pulmonary phthisis. Individually, and in families, all causes that depress vitality promote this disease. In my opinion, the

more frequent predisposing causes are impure atmosphere and dampness of locality. Any reducing disease, especially such as involves the breathing apparatus, as measles, bronchitis, or pneumonia, is also a predisposing cause of consumption, even when there is no hereditary tendency present. Dampness alone is not a prominent factor in the causation of this disease, but when coupled with imperfect ventilation, I believe we need not look further for the predisposing causes in a majority of the cases. Then, with insufficient resisting powers in persons exposed to unsanitary surroundings, the deadly germ gains access to the body through the use of tuberculous milk or beef, or through the medium of dried sputum, and in this manner the real cause of the disease is established.

To prevent the spread of the disease, every phthisical person should observe the sanitary measures now generally accepted as offering the surest means for its prevention and the safety of the community in general. I would recommend the disinfection of the sputa.

Families having a phthisical tendency should secure as nearly perfect ventilation as possible in dwellings, pure water-supply, nutritious food, live in the open air as much as possible, — in a word, observe the laws of hygiene.

I have never seen a complete recovery from phthisis. To reduce the mortality from this disease, see that the meat and milk supply is pure. Instructions should be sent to every family in the State teaching how to guard against contracting the disease, as well as plain rules for those already affected.

Merrimack — Hillsborough County.

W. W. PILLSBURY, M. D.

Topography. — The soil is porous. The surface is generally flat, about two thirds of the acreage being interval with sandy subsoil; the balance, clay subsoil, and hill land, with granite subsoil. The relative acreage is, hill, about two sevenths; flat, four sevenths; and swamp, one seventh. Very little stagnant water.

Phthisis. — Cases of pulmonary phthisis are rare in my practice. I believe the *bacillus tuberculosis* to be the cause of the

disease, and improper clothing, with a hereditary predisposition to the disease, the most common predisposing cause. Observed the hereditary tendency of the disease in the case of a married lady, aged thirty-four, whose mother and two brothers also died of phthisis.

As sanitary measures to prevent the spread of the disease, should recommend cleanliness and disinfectants. Would not allow any person to sleep with a tuberculous patient, nor even to occupy the same room. Would advise the disinfection of the sputa.

For families having a hereditary tendency to develop the disease, should recommend: 1. Good flannel worn next the skin both summer and winter; 2. Avoid a pork diet.

Have never observed a complete recovery from phthisis. In this section, a residence in the higher altitudes offers the greatest benefit to persons having a tendency to consumption.

Moultonborough — Carroll County.

WILLIAM H. H. MASON, M. D.

Topography. — The soil is productive. A portion is alluvial, some meadow. A large part is uneven and rocky. Subsoil clay and a portion hardpan. The geological formation is syenite, gneiss, feldspar, and common trapstone. The strips run north and south. Red Mountain lies almost wholly within this township, as does also a large portion of Ossipee Mountain, so that quite a large acreage is mountain land, — say one fourth; one fourth of the acreage is flat land, and the remainder uneven and rocky. No stagnant water.

Phthisis. — Cases of pulmonary phthisis are no more frequent here than in other country towns, — perhaps not as many as the average. There are not so many cases now as formerly, probably by reason of a better understanding of hygiene generally.

I am not sure whether the *bacillus tuberculosis* causes the disease, or the disease causes the bacillus, or both. The child may have tubercles in lungs at birth; they may lie dormant and harmless for a length of time or for life, or until some exciting cause produces inflammation, when cough, expectoration, cavity,

and phthisis follow. Not until then do we find bacilli. Where were they before suppuration? I cannot see that bacilli have anything to do with tubercular deposits.

Among the more common predisposing causes, should place heredity, debility at birth, imperfectly developed lungs. There is no doubt that a large portion of the cases of phthisis are developed by impure air, and dampness with impurity.

Perhaps the imperfect ventilation of schoolhouses influences the disease only so far as it affects the general health, and may thus lead to the development of this or any other disease to which the subjects may be predisposed. Our common schoolhouses are generally badly constructed. The small children are usually seated where they will breathe the most impure air.

Unsanitary conditions have a tendency to develop or hasten phthisis, or any other disease. The term, "unsanitary," is not always well understood by the people, — rotten vegetables in the cellar, a low place about buildings where matter is decomposed, an improperly constructed sink-spout, or one that discharges in close proximity to the dwelling, and many other conditions that produce disease and are not properly looked after, nor their deleterious effects well understood, should be classed under this head.

As a rule, all cases of phthisis can be traced back to tubercular heredity. In some cases the members of one family have the disease in succession. In many cases there seems to be a period of incubation from a few months to a year; sometimes it develops a bronchitis, which takes on a chronic form and lasts for many years.

As sanitary measures to prevent the spread of the disease, should recommend cleanliness; warm bathing sufficient for cleanliness only; do not practice bathing in cold water; wear flannels both summer and winter; secure clean and well-ventilated rooms and a generous diet, with fat meats; exercise in the open air; have no close associations with consumptive persons. Would recommend the perfect isolation of tuberculous patients. By all means disinfect the sputa; burn it if convenient, but destroy it in some way.

Persons having a hereditary tendency to the disease should not occupy a sleeping-apartment with another person, nor, particu-

larly, the same bed. They should be regular in their habits, and have much outdoor exercise.

Have never seen a complete recovery from phthisis. I am not sure that change of climate is beneficial, as a rule, to tuberculous patients. I believe it to be better to seek the healthiest locality where one is already acclimated. If a change is to be made, let it be before the disease is developed. Avoid high altitudes and rarified atmosphere.

To reduce the mortality from this disease, the disease itself must be reduced. Let there be a more general understanding of the nature of the disease, and the measures necessary to prevent and restrict it. Avoid everything having a tendency to develop consumption, or any other disease. Avoid compact and poorly ventilated rooms. Dress uniformly. Avoid sudden changes. The female members of families have a greater predisposition to the disease than the males, or, rather, are more susceptible to it; this may be accounted for by their being more indoors, as well as more frail. To overcome this tendency, all the functions of the system should be kept in a normal condition, especially the menstrual. Avoid the use of drugs as far as possible, yet attend promptly to the first indications of the disease by consulting a reliable physician. Tuberculous subjects should avoid matrimony.

Mont Vernon — Hillsborough County.

FREDERICK CHANDLER M. D.

Topography. — The soil is light; porous superficial soil and clay subsoil. The surface is uneven and elevated, with much ledge (granite). There is a paucity of flat and swamp lands, and a comparatively small amount of stagnant water.

Phthisis. — Cases of pulmonary phthisis are infrequent in my practice. Agreeably to the present theory, it seems fair to concur with the weight of evidence in most, if not all, cases of phthisis, especially the more acute forms, that the *bacillus tuberculosis* is the cause of the disease. In my opinion, the more common predisposing causes are sedentary habits, poor diet, inactivity, excesses, and heredity. Both imperfect ventilation and dampness are exceedingly harmful in their influence upon

the disease. Where there is a predisposition to the disease, consider that the imperfect ventilation of schoolhouses may have much to do with the causation of phthisis. Have had cases following the death of both parents from phthisis, which, to my mind, unequivocally confirms the belief that the disease may be hereditary. Have also observed that the disease is infectious, one head of a family contracting it from the other, — at least so supposed.

To prevent the spread of phthisis, would recommend the isolation of tuberculous patients, occupy the sleeping-apartment alone, secure an abundance of pure air, and exercise in various ways, nourish the body with proper food, and learn what proper food consists of.

Would isolate tuberculous patients to the greatest extent possible. Most emphatically would recommend the disinfection of the sputa.

Families having a hereditary tendency to develop phthisis should practice intelligent sanitation and avoid contact with the disease. They should make free use of albuminous foods, and each individual case should be treated *pro re nata*.

Whether or not I have ever observed a complete recovery from phthisis is a difficult question to answer, as an early diagnosis is not always easy to make. Many cases are very insidious in their incipiency. In the treatment of phthisis I think too much credit is given to drugs and too little to proper food and hygiene.

For those patients who cannot secure a change of climate, would advise an outdoor life, with as much active exercise as compatible with the endurance of the individual case, cheerful companions and occupations, change of scene. Methodical exercise to increase the vital capacity of the lungs, by forcible inspirations, is very essential.

The measures necessary to reduce the large mortality from phthisis is a broad subject, and scarcely within my grasp. I would begin at the fountain head and legislate laws to prevent the marriage and intermarriage of these unfortunates. In other words, I would use prophylaxis in all its details, which is more potent than so-called "cures."

NASHUA — HILLSBOROUGH COUNTY.

C. S. ROUNSEVELL, M. D.

Topography. — The soil is light, dry, and sandy inside the city limits. The surface is quite level in the southern portion of the city, the northern portion being more elevated. There are a few low ranges of hills of moderate elevation. So far as I am informed, there is but a small proportion of wet or swamp land and but very little stagnant water.

Phthisis. — During a period of nearly seven years of active practice in Nashua and vicinity I have had twelve cases of phthisis. I do most emphatically believe that the *bacillus tuberculosis* is the cause of the disease. Heredity and imperfect ventilation are among the more common predisposing causes. In my opinion three fourths more cases are caused by poor ventilation than by dampness. This is my experience, so far as I have been able to judge.

I think the imperfect ventilation of schoolhouses has had much influence in the causation of consumption in later life, and especially where there has been a family predisposition to the disease. I do not recall any cases that were caused by unsanitary conditions alone.

Of the twelve cases coming under my observation, six were in families having a pronounced phthisical predisposition. In two of the cases, both father and mother had died of the disease, and of the remaining four cases, either the father or the mother had died of the disease at an early age, — between twenty and thirty.

I have had one case which I think was much aggravated by if indeed it was not wholly due to infection; it was the case of a young lady who would persist in sleeping with another who had the disease well developed. There was no history of the disease in her family, but she soon showed symptoms of it and died in less than three months after the death of her friend, the disease developing very rapidly.

To prevent the spread of the disease I would recommend perfect cleanliness of apartments occupied by tuberculous patients; frequent washing or disinfection of all bedding and wearing apparel, everything, in fact, used in the sickroom. Spit-cups, etc., should be well supplied with some effective disinfectant, prefer-

ably a solution of Platt's chloride or carbolic acid. I would also direct special attention and care to the selection of foods, more especially meat and milk.

I would recommend the isolation of tuberculous patients as far as circumstances would admit in individual cases, but more especially in the matter of apartments. No person should occupy the same bed or even the same sleeping-room with a consumptive. I would not deprive a patient of the society of his family and friends under reasonable circumstances. I would disinfect the sputa.

In families having a hereditary tendency to develop the disease I would never allow the mother to nurse her children. School life should be carefully regulated, enjoyable exercise in the open air encouraged, and later, suitable business and occupations chosen which would involve abundant outdoor life and exercise, and other than sedentary habits. Regular habits in eating, sleeping, bathing, etc., should be observed.

I recall two cases, both young men, who presented all the characteristic signs and symptoms of phthisis. Until within a few months they had always been well and robust; had no history of the disease. They had formerly been accustomed to an outdoor life, but latterly had been in close rooms. They soon began to lose flesh, appetites became impaired, and a cough developed which grew worse from day to day. A radical change to an outdoor life and careful treatment soon wrought a change. It is now four years since they came to me, and they are apparently as well as ever; but nothing could induce them to go back to their close rooms.

For those patients who cannot secure a change of climate, I should recommend outdoor occupation, such as the strength of the patient will admit; regular hours of sleep; a good diet of the most generous kind and limited only by the powers of digestion; as a rule, such food as best suits the appetite of the patient, including as large a variety as possible; the different preparations of beef, cod liver oil, if it can be tolerated, and such other food preparations as can be taken with relish; milk and cream in abundance, if it can be taken.

To reduce the large mortality from this disease I would adopt all preventive measures possible, many of which I think should

be employed strictly in accordance with the peculiar individual characteristics of the patient. Sanitary and hygienic rules should be strictly adhered to; these I regard as of the utmost importance in all cases. Open-air occupations and good ventilation of sleeping-rooms, combined with proper food and regular habits, would, in my opinion, reduce the mortality of this disease more than all other measures combined; but to these should be added every agency that will in the least build up the general health.

In the case of those patients in whom the disease is developed to some extent, I would recommend such measures as will best prevent the contagion from spreading, rigid cleanliness of all apartments, disinfection of all sputa and discharges, frequent change of linen, bedding, etc., and the isolation of the patient as far as consistent with a due regard for his social enjoyment.

ROYAL B. PRESCOTT, M. D.

Phthisis. — Having been a specialist for five years past, I have had but few cases of phthisis. During twenty years of general practice in New York City, however, I had a large experience with the disease, not only in private practice, but also in various of the city institutions with which I was connected.

From the observations of those who have given special attention to this point, as published in the medical journals, I am inclined to the belief that the *bacillus tuberculosis* is the cause of phthisis. Heredity, and what is known as "taking cold," also, debility arising from other pathological conditions, are among the more common predisposing causes. I have no doubt that both imperfect ventilation and dampness are important factors in the causation of the disease.

If the imperfect ventilation of schoolhouses be a factor in the causation of consumption in later life, it must be, I think, a remote one. It is not unlikely, however, in the over-crowded schoolhouses of large cities, and I have no doubt of it in certain schoolhouses in New York City which I can recall.

I do not at this time recollect any case that I would be willing to say was caused by unsanitary surroundings alone. There are numerous cases of every-day occurrence that illustrate the hereditary tendency of the disease. I have in mind several instances of young people with this disease whose parents, one or both, were

victims of phthisis, and where it appeared in the offspring without other obvious cause. I have also known healthy wives to contract the disease from phthisical husbands, and *vice versa*.

The best possible sanitary measures should be observed to prevent development and spread of the disease ; climate, soil, drainage, ventilation, food, air, clothing, exercise, etc., etc.

Would isolate tuberculous patients to the greatest possible extent consistent with their social and physical comfort. Most emphatically the sputa should be disinfected.

As protective measures for families with a hereditary tendency to develop phthisis would recommend immediate removal to and continued residence in a climate containing the minimum amount of humidity, that of Colorado, for instance.

I can recall several cases of complete recovery from this disease. The parties are now living and in excellent health. The disease was recognized at an early stage and prompt and vigorous measures immediately adopted. The cases were treated ten years or more ago, and one or two of them seen within a recent period.

Tuberculous patients who cannot secure a change of climate should lead an absolutely outdoor existence. They should immediately relinquish all employments involving confinement within doors ; should wear flannel undergarments.

To reduce the large mortality from phthisis, would inaugurate the best possible hygienic measures, personal, local, and general. If practicable, would prevent the marriage of persons having a strong hereditary tendency to this disease.

New Hampton — Belknap County.

WILLIAM CHILD, M. D.

Topography. — The soil is sandy, but fertile. The surface is broken and uneven, with but little swamp land. The geological formation is granite. No stagnant water.

Phthisis. — Cases of this disease are not common in my practice. I believe the *bacillus tuberculosis* to be the cause of the disease. Among the more common predisposing causes of the disease should place dampness, bad ventilation, with contagion, or exposure to the *bacillus tuberculosis*. Imperfect ventilation is the great and all-important factor in the causation of the disease ;

dampness is of but little account when considered alone. Of course the imperfect ventilation of schoolhouses has an influence in the causation of the disease in later life. Many, perhaps all, cases arise from unsanitary conditions.

The cases that I have treated have not in any way been the result of heredity. They may all be accounted for by contagion. To prevent the spread of the disease would recommend an open-air life, regular habits, an even temperature, dry air, and a nutritious, mixed diet. Would recommend the perfect isolation of tuberculous patients; also the disinfection of the sputa.

In families having a tendency to develop or acquire phthisis, would separate the babes, children, and adults from parents, relatives, or others affected with the disease. Would have them eat, sleep, work, and live in the open air to the greatest extent possible.

Think I have observed complete recovery from phthisis. For patients who cannot secure a change of climate, would recommend complete ventilation of living and sleeping rooms; they should sleep alone and have a varied, nutritious diet.

To reduce the large mortality from this disease would scatter truths respecting it among the people. Make emphatic the fact that bad ventilation is the great indirect cause of the disease and that all (?) cases arise from contagion.

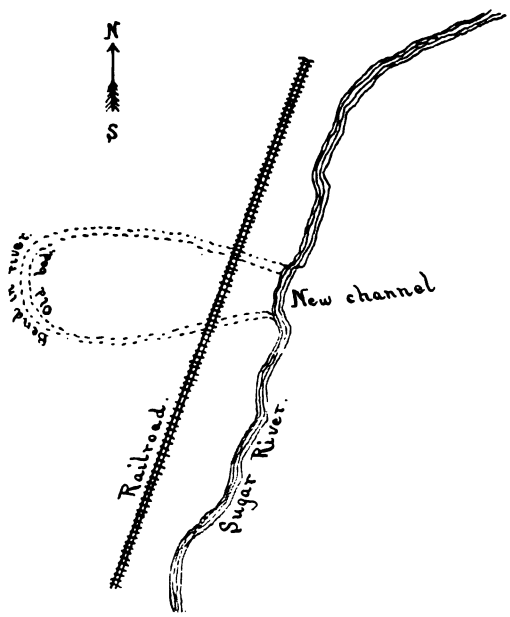
Newport — Sullivan County.

D. M. CURRIER, M. D.

Topography. — The soil is varied. The tops of the highest hills are composed of granite and are mostly bare. Below this and above the low land of the valley the soil is composed of loam generally, with a subsoil of clay interspersed with bowlders. The valley extends north and south through the town, with an arm extending east toward Sunapee, and was at no distant day the bed of a lake somewhat smaller than Lake Sunapee. This lake was drained by the river wearing a channel through the ridge of hill west of North Newport. Most of this lake bottom, with the exception of the Sunapee arm, which is, of course, gravel and unproductive, is a rich, arable soil with here and there an elevation composed of sand drift. Through this valley flows

Sugar river. The early geological formation of the town was azoic; three fifths hill, three tenths flat, and one tenth swamp land.

There are small pools of stagnant water in various parts of the town; the largest and most noticeable is just north of the village. Ten years ago the river formed at this place a large bend, as shown in the diagram.



The railroad was built across the river near the approximate ends of the bend. During a freshet a few years ago, the river cut its way through the banks east of the railroad, abandoning its old channel around the bend. The railroad company filled up the channel of the old river bed where it passed under the track, and the result is, the whole of the old bend is filled with stagnant water.

Phthisis. — Have some cases of phthisis under treatment all the time. I believe the *bacillus tuberculosis* to be the cause of the disease. Am of the opinion that the more common predisposing causes are an inherited feeble constitution, unable to withstand the

invasion of disease, and unsanitary surroundings. I think imperfect ventilation is a greater factor than dampness in the causation of phthisis. Think the imperfect ventilation of schoolhouses has had no part in the causation of consumption in later life; the bad effect would show itself immediately, — that is, within five years.

Had one case of laryngeal phthisis in which there was no apparent cause other than the very impure drinking-water of which the patient was wont to take large draughts. As to the hereditary tendency of the disease, I have known no cases that could not be accounted for by contagion. Have observed the immediate attendants upon cases sicken and die of the disease when there was apparently no previous tendency thereto. For instance, in a family of three boys and three girls, the oldest girl, from some source, contracted phthisis, and was cared for by the next younger sister, who came down with it a short time after the death of the elder sister. She in turn was cared for by the youngest sister, who also contracted the disease and died about one year after the death of the second sister. Each slept with the patient for whom she was caring. The brothers are strong, robust men; they were not at home during the illness of the girls.

Would isolate tuberculous patients as far as consistent with the mental and physical comfort of the patient. They should sleep alone and friends should not kiss them. Most certainly the sputa should be disinfected.

Families having a hereditary tendency to the disease should maintain all the functions of the body in as healthy a state as possible, not overtaxing them by exhaustion or exposure.

Have observed complete recovery from phthisis; in one case recovery took place with one lung destroyed.

Tuberculous persons who cannot secure a change of climate should secure good sanitary surroundings, viz.: Good ventilation both day and night; live in the open air as much as possible during the day; perfect cleanliness of habitation and person; a sponge bath each morning upon rising; a nutritious but not too stimulating diet in which the carbonates predominate; observe regularity in all the habits of life.

Eternal war must be waged upon the *bacillus tuberculosis* in order to reduce the large mortality from this disease.

T. B. SANBORN, M. D.

Phthisis. — Cases of pulmonary phthisis are very frequent in my practice. I believe the *bacillus tuberculosis* to be the cause of the disease. Among the more common predisposing causes are mal-nutrition from any cause, especially in a person having a hereditary tendency ; also, pneumonia, pleurisy, catarrh, mechanical irritants, condition of soil (moisture), etc. The disease prevails much more extensively among those whose pursuits are sedentary than among those who lead an outdoor life. Want of exercise, defective ventilation, and dampness contribute one third of the cases. I believe that the imperfect ventilation of schoolhouses has an influence in the causation of the consumption of later life.

The disease appears to be hereditary in one family in town in which there have been four deaths from phthisis within the past six years. Perfect hygiene should be observed to prevent the spread of the disease. All cases whose condition permits should be in the open air as much as possible ; others should be isolated in well-ventilated rooms. The sputa should be disinfected.

Families having a tendency to develop phthisis should wear plenty of clothing and live in the open air.

Have never seen a complete recovery from phthisis. I should rank exercise and outdoor life far above any known remedies for the cure of this disease.

As measures to reduce the large mortality from phthisis should recommend warm clothing, the feet well protected against cold and dampness, good, wholesome food, and an outdoor life.

PELHAM — HILLSBOROUGH COUNTY.

AMOS BATCHELDER, M. D.

Topography. — The soil is what is called "oak land." There is a sandy loam in the vicinity of the streams. The geological formation is gneiss granite, with steatite cropping out in one place. The acreage is mostly hilly, low interval in the vicinity of the streams, and some sandy plains and ridges of higher elevation but limited extent. There is little stagnant water.

Phthisis. — This disease is not common in my practice, nor in the town. The *bacillus tuberculosis* may be inherited in some systems, and developed by imperfect ventilation and other causes. Have not made very extended researches relative to this disease. In my opinion, the more common predisposing causes are badly ventilated rooms, and exposure to cold after leaving a heated atmosphere, together with insufficient clothing. No doubt imperfect ventilation and dampness have an influence upon the disease, but a long course of investigation would be necessary to decide these questions.

A young lady died recently of what, in my opinion, was no doubt a case of hereditary consumption, as her father, mother, and several sisters have all died of that disease within a few years; the last of the family is gone. They were not natives of this country.

Great care in the matter of clothing in our changeable climate, cleanliness everywhere, is necessary to limit the disease. Would isolate the tuberculous patient in a well-ventilated room, giving him every necessary attention. Think it would be well to dispose of the sputa by burying it.

Families having a predisposition to phthisis would do well to live in the clear atmosphere of Colorado, rather than in the hot, depressing climate of the South. They should observe all those measures which have a tendency to keep the general community in a healthy condition.

In my fifty-four years of practice I have never seen a complete recovery from phthisis. Those patients who cannot secure a change of climate should take those precautions that every well-informed person observes to maintain good health. Occasional deep breathing and friction over the chest are beneficial.

I would recommend as general measures to reduce the large mortality from phthisis, that each and every person lead a natural life; loosen the stay lacings, so that that the lungs may be used for their original intention, for breathing purposes, and give the stomach room to perform its natural operations, in order that "good digestion may wait on appetite," and to enable all the other digestive organs to do their duty without restriction; promptly attend to the calls of nature; eat to live, and not live to eat.

Peterborough — Hillsborough County.

W. D. CHASE, M. D.

Topography. — The soil is sandy, the surface being diversified with hills, vales, meadows, broad swells, and rills. The relative acreage is about seven parts hill, two parts flat, and one part swamp land. There is no stagnant water of any account.

Phthisis. — From January 1, 1885, to January 1, 1890, there were 238 deaths in town, 25, or a trifle over 10 per cent, being from consumption.

The evidence of investigators of the subject seems to be conclusive that the *bacillus tuberculosis* is the cause of this disease. Anything that lowers the tone of the body, as overwork, anxiety, insufficient clothing and food, may be a predisposing cause. I am of the opinion that more cases could be traced to dampness than to imperfect ventilation. So many factors in the causation of consumption arise during the period from childhood to adult life that it is difficult to determine how much influence the imperfect ventilation of schoolhouses may have had.

To my mind, the hereditary tendency of the disease is illustrated in the following case: Mrs. C. had a cough for many years, and finally died of phthisis. She had ten children, all of whom lived to mature years. Seven of them developed consumption; six died, and one recovered. Have never seen a case that I could attribute to direct infection.

To prevent the spread of phthisis, I would, if possible, compel all tuberculous patients to use spit-cups, and then burn them. I would not allow a person afflicted with phthisis to occupy the same bed with another. Would disinfect the sputa.

Families having a hereditary tendency to the disease should secure a well-drained soil about the dwelling, plenty of sunshine in all the rooms, a liberal supply of nutritious food, and protect the person with woolen garments in cold weather.

Have seen complete recovery from phthisis: M. C., when about forty years of age, had persistent cough, wasting of the body, expectoration of blood, etc. He was sick about two years, but is now living at the age of seventy years, in the enjoyment of good health. Three brothers and three sisters died of phthisis,

also his mother. A. C., when a young man, had a persistent cough, loss of flesh, expectoration of blood, etc. He finally recovered, and died of carbuncle at the age of fifty years. The autopsy showed many calcareous deposits at the apex of one lung.

I would advise those patients who cannot secure a change of climate to live outdoors as much as possible.

To reduce the large mortality from phthisis, would advise the immediate destruction of the sputa of consumptive persons, and the inspection of the meat and milk supply.

F. A. HODGDON, M. D.

Phthisis. — Cases of phthisis are quite frequent in my practice. I do most emphatically believe the *bacillus tuberculosis* to be the cause of this disease, while too close confinement indoors is the most common predisposing cause. A large per cent of my cases I know to have been induced by imperfect ventilation. I cannot say what effect dampness may have. I cannot trace a single case now in mind to unsanitary conditions alone.

I have now under treatment a patient developing phthisis whose father and mother both died of the same malady. I am also treating a lady who has no family history of phthisis, but whose husband died two years ago with the disease, and I fear the same difficulty with her, although it is not yet perfectly developed. In these cases both the hereditary tendency and the infectiousness of phthisis would seem to be indicated.

To prevent the spread of the disease would recommend perfect cleanliness of tuberculous patients, thorough disinfection of the room, spittoon, or spit-cup, and all other articles used by the patient, and perfect ventilation of the room occupied by him. Would have him as completely isolated as possible. By all means disinfect the sputa.

In families having a hereditary tendency to phthisis a change of climate to a higher altitude seems, at least, to defer the approach of the disease.

In only one case have I seen what is apparently a complete recovery; but I am watching that case suspiciously. Proper diet has, in my hands, been of great benefit in modifying the disease.

To reduce the large mortality from phthisis would recommend the isolation of tuberculous patients so far as can be consistently done. The patient should, by all means, sleep alone. There should be an abundance of pure air in the room at all times.

J. H. CUTLER, M. D.

Phthisis. — This disease is not very common in my practice, occasionally have a case. Believe the *bacillus tuberculosis* to be the cause in a few cases. Believe heredity, dampness, and climatic influences to be the more common predisposing causes. In a large majority of cases imperfect ventilation and dampness are important factors.

The imperfect ventilation of schoolhouses, in conjunction with the stooping posture assumed by the pupil, cannot fail to be most harmful.

The hereditary tendency of phthisis is clearly shown in families whose members develop the disease, one after another. I have in mind the case of a man who took care of a friend and apparently contracted the disease through contagion and died; this may be conjectural, notwithstanding the strong evidence.

To prevent the spread of the disease would recommend perfect sanitation. It is a mooted question as yet whether or not tuberculous patients should be isolated. Think it well to disinfect the sputa.

Families inheriting a predisposition to the disease should have the best of nourishment, the best of habits, and a change of climate.

In a genuinely seated case recovery seldom takes place, — not without a change of climate. Those patients who cannot secure a change of climate should have the best of food and none but good habits.

To reduce the mortality, would teach people to take care of themselves.

PLAISTOW — ROCKINGHAM COUNTY.

PITTS E. HOWES, M. D.

Topography. — The soil is generally good, being a mixture of loam, clay, and gravel. The surface is generally even in the larger portion of the town ; the relative acreage is about two thirds

hill and flat land, and one third swamp land. There is not much stagnant water.

Phthisis. — This disease is not at all common in my practice; have seen but one case since I have been here. I believe the *bacillus tuberculosis* to be the cause of phthisis, but I think in a large number of cases it is hereditary. Imperfect ventilation is probably a much greater factor than dampness in its causation, unless the dampness be due to stagnant water. I do believe that the imperfect ventilation of schoolhouses has much influence in developing the consumption of later life, especially in those of a consumptive tendency.

To prevent the spread of the disease would recommend perfect ventilation, as far as possible, and a careful disposal of the sputa, and if these measures are strictly adhered to I do not regard the isolation of the patient as essential. Should most certainly disinfect the sputa.

In families having a hereditary tendency to the disease, a large amount of outdoor exercise should be taken at an early age and continued through life. I have never seen a complete recovery from phthisis. Consumptives will derive the most benefit from outdoor exercise, and they should engage in those occupations which will call them out of doors the greater part of the time.

Teach the people that by proper exercise and a correct mode of life a large per cent of inherited consumption can be rendered inert; thus will the mortality be reduced.

Plymouth — Grafton County.

Cyrus K. Kelly, M. D.

Topography. — The soil is rocky, sandy, and in some sections clayey, and very little marsh land in any section of the town. The geological formation is granite, feldspar, mica, and quartz, and some "fools' gold." The surface is generally uneven, the greater part of the acreage being hills and valleys; little or no swamp land, and comparatively no stagnant water within the town limits.

Phthisis. — During a practice of thirty-three years I do not recall to mind a dozen cases of phthisis treated by myself or by my neighbors in the profession. Emphatically I do believe the

bacillus tuberculosis to be the cause of pulmonary phthisis. It is also my belief that accidentally taking cold, followed by congestion of the lungs and often by pneumonia, is the most common predisposing cause of the disease. I am unable to say what influence imperfect ventilation and dampness may have in the causation of the disease, not having any data on which to base an opinion. I would here state a notable fact, however, and that is, that nearly all the cellars in our village are damp and many have water in them the year round, which condition is supposed, by many, to favor the development, not only of lung diseases, but rheumatism as well; while the fact remains that we have but very little of either here. In my belief, dampness in cellars is, at least, not a factor in developing phthisis. I would also mention, in this connection, that a large majority of the cases of phthisis treated by me have occurred on elevated land, and on sandy soil at a lower elevation.

Judging from my limited experience with the disease, I do not believe the imperfect ventilation of schoolhouses has had any influence in the causation of consumption in later life. Fifty years ago the ventilation of schoolhouses all over the region of my acquaintance was as bad as it could well be, as compared with modern methods, and yet I can recall but two of my schoolmates who died of phthisis or any other lung disease. Many of them are living to-day, and in good health for persons of their ages. I know of several who are more than seventy-five years of age, and likely to live several years longer. The two cases referred to were in families where intermarriage had been going on for several generations, and the same custom is still practiced more or less, and their mental caliber is rated lower than that of their lungs.

I recall but one case that seemed quite positively due to unsanitary surroundings, and that occurred many years ago. The mother of a family of nearly a dozen children died of phthisis at the age of nearly fifty years. Having no privy, the buildings, including the house, were surrounded by the waste of the whole family, and the stench, especially in hot weather, was decidedly rank, as bad, I should judge, as that described by Jack Falstaff, while in the bucking basket, as "the vilest compound of villainous smells that ever offended nostril." If unsanitary conditions produced

the disease in this mother, the wonder to my mind is that the whole family did not die of that or some other disease before they had lived out half their days. One other fact in connection with this family, which I never could reconcile with the transmissibility of phthisis: This mother was ill with phthisis between four and five years. At the age of forty-five she gave birth to a healthy male child of eleven pounds weight. Escaping most of the diseases incident to infancy and childhood, he arrived at manhood the strongest and healthiest of the family. At the age of fifty-one he died of malignant typhoid fever, and never in his life had a symptom of pulmonary disease, and had it not been for this or some other acute disease, might have been alive and well to-day. The Bible says, "Great is the mystery of godliness," and I say, great is the mystery of disease in some instances, and to me this was one of them.

I recall to mind one family where both parents were in feeble health, the mother of a decided consumptive habit. Four children were born to them, but none lived to be over sixteen years of age; all died of pulmonary phthisis. The mother died of the same disease at the age of thirty-nine. I never learned the fate of the father, as he removed to another part of the country after the death of his wife.

As measures to prevent the spread of this disease I would recommend plenty of exercise in the open air in all good weather; a generous diet of both vegetable and animal food, and varied as much as possible; avoid sudden changes of temperature and all extremes of whatever nature; "early to bed and early to rise"; in some instances, and perhaps in many, malt and perhaps spirituous liquors if sound judgment should direct their use. I believe reasonable stimulation in many cases to be right, notwithstanding I am in favor of total abstinence in health. As a rule, I believe Nature in many instances can do more than drugs to restore the human system to a healthful condition.

I would recommend the same precautions in regard to isolation that are considered necessary in other diseases supposed to be infectious, as some suppose phthisis to be — but not to my mind. Most decidedly I would recommend the disinfection of the sputa and all other precautionary measures, on the theory that "an ounce of prevention is better than a pound of cure."

I think I have never known of a complete recovery from a case of confirmed phthisis. I think further investigation into the etiology of phthisis will be necessary before any general plan can be adopted to reduce the large mortality from the disease.

Portsmouth — Rockingham County.

JOHN J. BERRY, M. D.

Topography. — The soil is composed of clay and diluvial sand, etc., etc. The geological formation is flinty slate, imperfectly stratified, and frequently in combination with granite vein and trap dyke. The soil overlying these is such as naturally results from the disintegration of such deposits. Tertiary clays, blue and brick, are to be found in some localities; and in low lands, swamps of peat and muck, in which are evidences of submerged forests, and where wood has been found in a good state of preservation. There is very little stagnant water. We have considerable low and "made" land, and there are many damp cellars in the city; many of the houses are old and poorly ventilated.

Phthisis. — Cases of this disease are quite frequent in my practice. I believe the *bacillus tuberculosis* to be one of the causes of phthisis, but not the sole cause. Among the predisposing causes should place bronchitis, pleurisy, pneumonia, and poor nutrition, especially of the nervous system. Undoubtedly, imperfect ventilation acts as a causative factor, by producing imperfect oxygenation, and hence faulty nutrition. Dampness is a frequent cause of the disease, as it produces congestion of the respiratory tract and catarrh of its mucous membrane. I think the imperfect ventilation of schoolhouses has a slight influence in the causation of the consumption of later life. Have seen a great many cases that were pretty surely due to unsanitary conditions.

Have noticed a hereditary tendency in a certain number of cases, but not in most. To prevent the spread of the disease, would recommend, as sanitary measures, partial isolation of patient, disinfection of sputa, thorough ventilation of dwelling, and perfect drainage of his locality.

I would advise the partial isolation of tuberculous patients, viz.: I would have them sleep by themselves in thoroughly ven-

tilated apartments, and be out of doors as much as possible. Would disinfect the sputa.

Families having a tendency to develop phthisis should seek a dry, equable climate of moderate elevation; lead an outdoor life; exercise, including special attention to chest development; maintain good nutrition, and observe general personal hygiene.

Have occasionally observed complete recovery from phthisis, but not often.

Tuberculous persons who cannot secure a change of climate should take the greatest amount of outdoor exercise possible, a generous diet, and attention to the general rules of hygiene.

As general measures to reduce the large mortality from phthisis, would recommend a residence in dry and elevated spots; better ventilation of dwellings and school buildings; early and systematic phisiological training in the schools and in the homes; more outdoor exercise, together with due observance of the general rules of personal hygiene. I would here state my belief that a person with well-developed lungs and good general health cannot acquire phthisis except through grave exposure.

D. W. JONES, M. D.

Phthisis. — Cases of this disease are very frequent in my practice. I believe that the *bacillus tuberculosis* is the cause of the disease, and that a cold, damp atmosphere is the most common predisposing cause. Imperfect ventilation has very little to do with the causation of the disease, except, indirectly, by depressing the vital forces. I consider dampness an important factor, as it favors the growth of the bacillus, the specific cause of the disease.

In schoolhouses, the poor judgment and ignorance concerning the natural laws governing the currents of air, on the part of teachers, in admitting cold air and creating drafts, not infrequently act as predisposing causes. Have never observed any cases due to unsanitary conditions.

I do not believe the disease is hereditary, — strictly so. Of course a feeble constitution from heredity would favor the invasion of any disease. Have known healthy wives to contract the disease from infected husbands, and *vice versa*; children from parents; children from other children in the same family, —

apparently from hereditary influences, but in reality from contagion.

To prevent the spread of phthisis, would recommend isolation. Tuberculous patients should not occupy the same apartment with another, nor, if possible, the same house with healthy persons. Would certainly disinfect the sputa.

As a protective measure in families having a predisposition to the disease, would recommend the breathing of ozonized air, either artificially procured or secured by change of climate to high altitudes. Have never observed a complete recovery from phthisis when positive pathognomonic symptoms have been present.

Tuberculous patients who cannot secure a change of climate should avoid extremes of temperature and the breathing of cold, moist air.

To reduce the large mortality from this disease, would recommend the wearing of flannel next the skin both summer and winter, and the maintenance, as far as may be possible, of an equable temperature.

J. W. PARSONS, M. D.

Phthisis. — Cases of this disease are frequent in my practice, without, perhaps, being very frequent. It is my impression that there are not so many cases as twenty years ago; but this may be due to a better class of patients.

From present teachings, I am inclined to the belief that the *bacilius tuberculosis* may be the cause of the disease, but have strong doubts. Want of general care of health, neglect of simple "colds," and heredity are, in my opinion, the more common predisposing causes. Some cases may be due to imperfect ventilation, but none to dampness. Am inclined to think the bad air in schoolhouses less harmful than the bad air at home. It is my impression that some cases may be due to those unsanitary conditions common with poverty and ignorance. I have no records from which to give facts concerning the hereditary or infectious tendency of the disease.

As sanitary measures to prevent the spread of the disease, would teach persons to take care of their health, especially of simple

"colds," and to provide themselves with good food, pure air, proper clothing, etc., etc.

From our present knowledge of the nature of the disease, isolation is to be advised in all cases; also the disinfection of the sputa.

Families having a hereditary tendency to the disease should be advised against intermarriage, and should seek a change of climate.

I have occasionally observed a complete recovery from phthisis.

To reduce the large mortality from this disease, would educate the people upon all sanitary matters, and would instruct the children in sanitation as well as in mathematics.

N. L. FOLSOM, M. D.

Phthisis. — We have our full share of consumption here. The *bacillus tuberculosis* may be the cause of the disease, but I think the disease may be induced by taking cold and by imprudences. My patients are directed to wear flannels from head to feet, night and day, summer and winter. I think the most common predisposing causes are taking colds, insufficient clothing, carelessness, ignorance, and thoughtlessness in caring for the health in general. Dampness is probably a more important factor than imperfect ventilation in its causation. Think the imperfect ventilation of schoolhouses can have but little effect, unless it be in undermining the constitution.

The hereditary tendency of the disease was pretty clearly illustrated in one family in which three daughters and one son died with it. I do not know what caused the father's death, but the mother is the only one living.

Exercise, good food, and care to maintain good health are the best measures to prevent the disease.

I would isolate tuberculous patients so far as to have them sleep alone. Would disinfect the sputa.

Families having a predisposition to the disease should wear flannel underclothing summer and winter, each member should have a separate sleeping-apartment, they should live in a healthful locality, have good food, exercise in the open air, and keep the skin cleanly by friction, etc.

If a patient recovers, he is said not to have had consumption; some who were supposed to have the disease regain their health, while others succumb after a long struggle.

Raymond — Rockingham County.

GEORGE H. GUPTILL, M. D.

Topography. — The soil is chiefly sandy; the village is situated on sandy soil. The surface is hilly and broken. Should judge from seven to nine tenths of the acreage was hill and flat lands. The Lamprey river, a small stream, flows through the town, and has along its banks an average amount of "flowage," as do all small streams, and this flowage changes, of course, as to moisture at different seasons. We have but little stagnant water. In places among the hills may be found small pools of water fed by springs, which become dry as summer advances, and there are small extents of marsh along the river which also change condition according to the season.

Phthisis. — Cases of this disease are not very frequent in my practice. I think the *bacillus tuberculosis* is a cause of the disease just so far as the system is in a condition to favor its development; thus far and no farther. I think we have cases of phthisis without the bacillus, therefore it is not essential to the disease, or rather not to all cases of pulmonary consumption. So I will say that I consider the *bacillus tuberculosis* a cause of phthisis, and a frequent one.

First of all among the predisposing causes I would place an inherited or acquired diathesis, as predisposing to scrofula, etc., etc. Again, the imperfect expansion of the lungs with pure air; also all habits tending to lower the general tone of the system. Sexual excesses are a great factor in its causation. I name these as predisposing causes outside of the *bacillus tuberculosis.*

Am of the opinion that but a very small proportion are caused either by dampness or imperfect ventilation. Of course, either carried to excess would favor its development, but generally speaking they are causing but very little of the disease to-day. Of course these conditions favor its development, but it is my opinion that their influence is over-estimated. The conditions

in some schoolrooms are very bad, but in the majority of them the ventilation has little influence on the disease.

Have known a few families in which the children of consumptive parents, one or both, have died with consumption; but think I have observed more cases among the children of healthy parents, and where the disease was due to some indiscretion or error in life.

Last November I was called to see a child whose aunt had died with phthisis the preceding May. The child had been ill for two or three weeks, but was attended by another physician, so I have not a full history of the case. However, I found her with incipient phthisis, due, I have no doubt, to infection; she had a scrofulous diathesis.

In this disease all sanitary measures tending to strengthen and develop the system should be encouraged. All sleeping-apartments should have an abundance of pure air. Particular attention should also be given to secure good drainage.

I would not isolate the patient to any extent, believing that the disinfection of the sputa, etc., as well as the surroundings, together with other measures, will be effectual in preventing the spread of the disease by contagion. Would certainly disinfect the sputa.

The chief measures to be observed by families having a predisposition to phthisis are: Physical culture, especially chest development; avoidance of all sexual excesses; particular attention to the ventilation and cleanliness of sleeping-apartments; outdoor work or exercise; pure air; food rich in phosphates; regular hours, meals, etc.

As to complete recovery, I have never seen a case, for the lung is always damaged by phthisis. I have known several cases in which good health has been recovered, but with an impaired lung, which, however, gave little annoyance.

Tuberculous patients should avoid a sudden change from a dry to a damp and from a hot to a cold atmosphere. I think that every person with a tendency to phthisis can, by consulting a competent physician and following his directions explicitly, successfully combat the disease; but it is a deplorable fact that in many cases the disease is neglected until too late.

Rochester — Strafford County.

JAMES FARRINGTON, M. D.

Topography. — Rochester village is about 225 feet above the sea level. In its immediate vicinity the land is a flat, sandy plain, with low, swampy ground on the north and northeast; on the south and west, at the distance of one half a mile, the land is much higher and the soil fertile. In the southwest part of the town are immense clay fields, from which millions of the finest brick are made annually.

Along Salmon Falls and Cocheco rivers, clay slate appears as one of the natural formations, while one mile south of the village, on high land, is a fine and valuable granite ledge. Independent of the geological formation and foreign to the locality, some two miles distant in a westerly direction are acres covered with immense bowlders left in the valley and on the side-hill, while at a short distance on all sides surrounding scarcely a stone is to be found.

Without any fixed data, should say that two thirds of the acreage of Rochester is high land, some hills rising nearly two hundred feet above the level plain; of the other third, some one hundred acres, lying in a north and northeasterly direction from the village, are low, swampy land, commencing about one half mile away.

Some twenty-five acres of peat land just north of the village for several months of the year (including spring and fall) are partially covered with water which has no chance of escape or drainage, but must either evaporate or run off through the sandy soil of the plain. Cocheco river, which runs near the center of the village, usually gets very low in the autumn, leaving acres of vegetable matter exposed for decomposition.

Phthisis. — I think in my forty-three years of extensive practice within a radius of ten miles, I may have averaged three cases of pulmonary phthisis each year, two of which may have been in the town of Rochester. I give this without any recorded cases on which to rely with certainty, but from the most correct estimate I am able to form.

I think the *bacillus tuberculosis* may be the cause of many

cases of phthisis. Aside from hereditary origin, am of the opinion that the disease is most frequently the result of exposure to cold and wet, and as a sequela to other diseases, more particularly measles. In damp locations, poorly fed and half-clothed children are often the victims of phthisis. Never knew cases to be due to imperfect ventilation, unless it were in shoe shops and mills where there was much dust. Damp locations, with confinement indoors and no sunshine, are a predisposing cause of phthisis. I have never considered the imperfect ventilation of schoolhouses to be a factor in the causation of the consumption of later years. Think I never knew a case to originate from unsanitary causes alone.

In one family consisting of eight children, six have died of phthisis between the ages of seventeen and thirty-five. The mother, who was from a consumptive family, also died with the same disease. The two remaining children, boys, one in this town and one in Massachusetts, are in poor health and sure to die of phthisis. I have no doubt that two thirds of all my cases have been hereditary. One daughter of the above-named family married a man who was strong and healthy at the time of his marriage. They lived together some two years, when the wife died of *phthisis pulmonalis*, and in something more than two years the husband died of the same disease. There was no history of phthisis in his family, so it could not have been hereditary in his case, but was no doubt due to infection. Such cases have not been infrequent.

To prevent the spread of the disease would prevent the intermarriage of consumptives, and provide the destitute with proper homes, food, and clothing. I would isolate tuberculous patients as far as may be done without removing them from their homes or depriving them of proper care and attention. Would certainly disinfect the sputa.

Would recommend families having a hereditary tendency to the disease to remove to a warm, dry climate, one not subject to the changes common to New England along the coast.

Have been flattered sometimes with the hope of perfect recovery in cases of phthisis, but am in no wise positive that such was the continued result.

Patients who cannot secure a change of climate should have a good, nutritious diet, protection from cold and damp, warm clothing, and in all suitable weather should be continually in the open air. Everything about the patient should be made cheerful and all amusements employed that will not fatigue body or mind.

Salisbury — Merrimack County.

G. P. TITCOMB, M. D.

Topography. — The soil is a sandy loam; the geological formation a copperas rock. The relative acreage is five eighths hilly, one fourth flat, and one eighth swamp land. There is not much stagnant water.

Phthisis. — This disease is not common in my practice. The *bacillus tuberculosis* may be the cause of phthisis, but I do not believe it would develop in a healthy and vigorous person. I place incompatibility of temperament in parents as the most common predisposing cause.

I am of the opinion that imperfect ventilation and dampness have no influence in the causation of the disease, except as they have a tendency to lower the vitality of the system. The imperfect ventilation of schoolhouses in this place has had no part in inducing consumption; but I believe the people should be instructed, through the press and by the State Board or Health, in the ventilating and lighting of public buildings, and as an aid to school boards and other public officers.

This disease appears to have a hereditary tendency in one family in this place, the father and one daughter having died with phthisis, and the remaining children, three in number, show a tendency in that direction.

As a sanitary measure to prevent the spread of the disease, would advise some cheap receptacle that can be conveniently carried, to receive the sputa.

Would isolate the tuberculous patient to the extent that he should have a sleeping-room by himself. Would disinfect the sputa by fire.

Families having a consumptive tendency should have plenty of pure air, sunlight, exercise, nourishing food, together with a

thorough destruction of the sputa. Have never observed complete recovery in a case of phthisis.

It is difficult to say what measures should be recommended in order to reduce the large mortality from consumption. It is not probable that any law prohibiting a consumptive from spitting on floors of public halls, cars, or on sidewalks would be respected; neither would any change in our matrimonial laws be regarded. Can see no better plan than to instruct the public in the supposed causes and the dangers of phthisis, as well as the most effective means for avoiding them.

SANDWICH (NORTH) — CARROLL COUNTY.

H. J. BINFORD, M. D.

Topography. — The soil is variable, consisting for the most part of sand, loam, and clay. The soil has a sub-stratum of clay. The acreage is about equally divided between hill, flat, and swamp land. There is not much stagnant water.

Phthisis. — This disease is not common in my practice. Believe the *bacillus tuberculosis* to be the cause of phthisis. Am of the opinion that heredity and contagion are the most common predisposing causes. Imperfect ventilation is a very active factor in its development, but cannot see how dampness should very decidedly favor the disease. The improper ventilation of schoolhouses probably has an influence in the causation of consumption of later life.

As sanitary measures to prevent the spread of the disease, would recommend the isolation of tuberculous patients, good hygienic surroundings, the utmost care to remove the sputa before it has become dried and powdered, and it should on no account be deposited elsewhere than in vessels for its receipt.

Tuberculous patients should occupy a room or a suite of rooms not entered by the other members of the family except as nurses. They might receive callers in a room not commonly occupied. Would disinfect the sputa.

Families having a predisposition to phthisis should exercise great care to live in healthful localities, giving especial attention to ventilation, diet, and outdoor avocations, avoiding depressions of health or strength.

Have never seen a recovery from phthisis. I believe that the open air is a great lung purifier and body regenerator. Diet is also very important in cases of this disease.

As general measures to reduce the mortality from phthisis, would recommend: 1. Isolation, first and most important; 2. A better construction of residences, giving more attention to ventilation; 3. Better care of general health, avoiding depression; 4. Outdoor avocations for those predisposed to the disease.

Seabrook — Rockingham County.

D. W. COLCORD, M. D.

Topography. — The soil is sandy. About one per cent of the acreage is hill land, ninety per cent flat, and nine per cent swamp. There is not much stagnant water.

Phthisis. — This disease is not common in my practice. Am undecided whether or not the *bacillus tuberculosis* is the cause of phthisis. Am of the opinion that hereditary tendencies are the more common predisposing cause. Think a small part of the cases are due to imperfect ventilation or dampness. The imperfect ventilation of schoolhouses has, in my opinion, very little influence in its causation, but assists very much in its propagation.

Fifty per cent of all my cases have been due to heredity. In one family of three persons, all died of phthisis within thirteen months, — probably due to infection.

Would recommend, as sanitary measures to prevent the spread of the disease, plenty of living-rooms in dwellings, good, dry air, cleanliness about premises, regularity in eating, and wholesome food and drink.

Would isolate tuberculous patients so far as not to allow any other person to sleep with them. Most emphatically would recommend the disinfection of the sputa.

Families predisposed to the disease should be surrounded by good general sanitary conditions, each member should room alone and sleep alone, and should use precautions to promote good health. Have observed complete recovery from phthisis. Tuberculous patients who cannot secure a change of climate should give particular attention to general hygienic measures.

To reduce the mortality from this disease, would recommend

the isolation (limited, of course) of tuberculous patients, non-intermarriage of phthisical persons, removal to more favorable localities, change of occupation in many instances, suitable clothing, regular hours for eating, and proper food ; also regularity in work, sleep, and recreation. Temperance in all things. Married phthisical subjects should not become parents ; thereby the number of prospective consumptives would be reduced.

Somersworth (Great Falls) — Strafford County.

ALVIN JENKINS, M. D.

Topography. — In some portions of the township the soil is rather thin and poor, while in others it is more fertile and supports a luxuriant vegetation. The surface in some portions is uneven, spreading out into plains. About one half the acreage is flat land and the remainder hilly, with very little swamp land. Scarcely any stagnant water.

Phthisis. — Cases of this disease are not remarkably frequent in my practice, not so much so as they were twenty-five years ago, I think. In regard to the cause of phthisis, I am rather wondering what may be the cause of the *bacillus tuberculosis!* Am of the opinion that the more frequent predisposing causes are sexual abuses, scanty and innutritious food, and living or being in too shady and damp localities, where the sun's rays scarcely penetrate, and where blinds are kept closed to exclude the sunlight. Of the last one hundred deaths from consumption in New Hampshire, I should say that imperfect ventilation might claim ninety-five per cent, and dampness five per cent.

Most emphatically I do believe that the imperfect ventilation of our schoolhouses has much influence in the causation of consumption of later life. My blood seems to turn cold when I think of the conditions that I have seen in schoolrooms ! I knew a family consisting of husband, wife, and six children. The parents were healthy and from good stock, but they all died within fifteen years after having moved into a modern house, surrounded by shade trees, and with a continuously wet cellar ; the blinds were always closed.

Again, some twenty-five years ago, I was called one mile out from a flourishing village to see a young woman, aged twenty-

five, dying with consumption. The farm was near the road leading to the brick schoolhouse, and the mother of the patient remarked: "Doctor, this is the last of six girls, no relation to each other, who went down this road to that schoolhouse; they all died of consumption."

I knew a family consisting of parents and some ten children. As the children grew up, about half of them left home and never showed any signs of phthisis, while all those who remained at home died of consumption. It would seem that those children who remained at home may have contracted the disease one from another; while those who remained away (completely isolated) escaped, showing that to inherit weak lungs may be regarded, in many cases, as "hereditary tendency to phthisis."

To lessen the frequency of this disease, would advise the free ingress of pure air to the dwelling, a general opening of blinds to admit the sunshine and air, even though the carpets may fade and shade trees have to be sacrificed.

I would isolate tuberculous patients to rather a limited extent. The sleeping-room, but not the bed, may be shared with another person if particular attention is given to cleanliness. The patient should use separate towels, handkerchiefs, etc. Would not recommend the disinfection of the sputa if it is looked after and disposed of in a proper manner by the patient.

Persons having a predisposition to the disease should avoid all sexual excesses and everything tending to debilitate the system; they should maintain an even temperature of the body by wearing all-wool flannel next the skin, — lighter in summer, heavier in winter; should use the flesh brush freely over the entire body, substituting a coarse cloth when the flesh is moist; should fully expand the lungs by deep inhalations of pure air night and morning. In all places avoid air that has already been inhaled.

Think I have seen a complete recovery from phthisis: A married lady, aged about forty-five years, and the mother of three children, became much emaciated, and was in all respects a typical case. After treatment she became convalescent, recovered rapidly, and gained twenty pounds in a few months. To my certain knowledge she continued in good health for some eight or nine years, but how much longer I do not know, probably to "a good old age."

Tuberculous persons who cannot secure a change of climate should have all shade trees removed from about the dwelling, bask in the sunshine, see that no dampness arises from the cellar, even if it has to be filled in partly or wholly with dry sand, see that there is proper ventilation under the whole house, take much sensible exercise in the open air, and as regularly as possible.

Suncook — Merrimack County.

JOHN R. KIMBALL, M. D.

Topography. — The soil is gravel, loam, and clay. A large part of the acreage is hill land, a small proportion swamp. Very little stagnant water, I should say.

Phthisis. — We have about the average number of cases for a town of this size. I do not know whether the *bacillus tuberculosis* is the cause of phthisis or not. I think there is a transmitted tendency to phthisis in some families, and then debility from any cause prepares the system for its development. I should say that quite a large part of the cases might be due to imperfect ventilation, especially in large factories and in factory boarding-houses.

Imperfect ventilation in schoolrooms might, by inducing a feeble condition of the system generally, lead to the development of consumption in later life.

Pure air, and plenty of it, should be recommended to lessen the frequency of consumption. Would disinfect the sputa of tuberculous patients.

Persons predisposed to consumption should avoid bad air, unsanitary surroundings, and any exposure tending to debilitate the system.

I have seen recovery in cases that presented very many of the symptoms and signs usual in tubercular consumption.

Tuftonborough — Carroll County.

D. B. TUCKER, M. D.

Topography. — The soil is light, and sandy in places. The geological formation is rock and sand; no subsoil. The acreage is mostly hilly, with several large meadows, and but little flat land. Not much stagnant water.

Phthisis. — This disease is not as common in this town as in many other localities. Believe the *bacillus tuberculosis* is the cause of phthisis. Place heredity, debilitating influences, mode of living, poor ventilation, and constitutional weaknesses among the more common predisposing causes.

Imperfect ventilation and dampness are not prominent factors in this locality. Imperfect ventilation in schoolrooms is a more potent factor in the causation of consumption in larger districts and more expensive schoolhouses.

Think phthisis is largely hereditary, as a rule. In one case a healthy man married, and in two years his wife died of phthisis. One year later he had hemorrhage of the lungs, and in eighteen months he died of phthisis; no inherited tendency in his case. The disease in his case was undoubtedly due to contagion.

The measures necessary to limit the disease are good ventilation, good drainage, regular habits, avoidance of sudden changes of temperature, and a careful inspection of milk and meats.

When phthisis is recognized in a patient he should be isolated as much as possible from the family, having apartments for his especial occupancy. The sputa should be burned immediately.

Persons having a hereditary tendency to consumption should build up the general health by outdoor exercise and well-regulated habits and occupations.

Have never observed a complete recovery from phthisis.

To reduce the large mortality from phthisis, would recommend the careful investigation of family pedigree, and avoiding marriage where there is a family history of phthisis, scrofula, or syphilis; also the appointment of suitable persons to make a rigid inspection of all foods liable to contain the *bacillus tuberculosis,* such as meats, fowl, and milk, which are placed upon the market.

Tuftonborough Center — Carroll County.

T. AVANS HALEY, M. D.

Topography. — The soil is sandy. The relative acreage is probably one third hills, one sixth swamps, one half flat land. There is very little stagnant water.

Phthisis. — Cases of this disease are not frequent in my practice. Believe the *bacillus tuberculosis* is the cause of phthisis, while an inherited tendency, bad air, and neglected colds are the more common predisposing causes. Think about three fourths of all cases are induced by imperfect ventilation; very little due to dampness. The imperfect ventilation of schoolhouses probably has an influence in the causation of the consumption of later life.

I have in mind one family in which the disease has descended from grandparents to grandchildren. There have already been six fatal cases in this family, and the indications now are that there will be three or four more. In another family it has descended in a like manner until only one grandchild remains.

A young married woman whom I was called to attend was cared for by her husband, apparently a strong, robust man. He died from consumption in about two years, no doubt contracting the disease by being so constantly with her.

To prevent the spread of the disease, would recommend free ventilation, the free use of disinfectants, and, as far as possible, isolation of patients. Would isolate tuberculous patients to the extent consistent with their necessary care and comfort. Certainly would disinfect the sputa.

Predisposed persons should take much outdoor exercise, have a generous diet, and the protection of flannel underwear at all seasons of the year.

Only once have I seen a complete recovery from phthisis.

The necessity for good ventilation, suitable food, and protection from sudden changes of temperature should be impressed upon the people.

Walpole — Cheshire County.

Abel P. Richardson, M. D.

Topography. — The soil along the Connecticut river and on the table lands east is fluviatile, while back on the hills it is more tenacious, being a heavy loam, and having in some instances an admixture of clay. Most of it is arable. The water-worn pebbles near the village of Drewsville bear evidence of the existence of a lake in that region at some remote time. The rock composing Kilburn Mountain is gneiss, syenite, and mica slate,

merging in some places into fibrolite, a very hard formation which is almost indestructible. Ledges of mica slate are found in the south part of the town; quartzite, serpentine, and graphite are found in limited quantities. Probably nine tenths of the entire acreage is hilly; there are flat terraces near the river, and but very little swamp land. No stagnant water.

Phthisis. — This disease is not very common in my practice, one or two cases a year on an average. In 1869 there were three deaths from consumption in town, according to the records; 1870, 6; 1871, 3; 1872, 5; 1873, 2; 1874, 4; 1875, 5: 1876, 2; 1877, 4; 1878, 1; 1879, 4; 1880, 4; 1881, 3; 1882, 2; 1883, 2; 1884, 5; 1885, 5; 1886, 3; 1887, 4; 1888, 1; 1889, 1; making an average of a little more than three deaths per year for the past twenty-one years. I believe the *bacillus tuberculosis* to be the cause of the disease. Hereditary conditions favorable to the development of the bacillus are the most common predisposing cause. The bacillus probably flourishes either in dampness or where there is imperfect ventilation. Do not believe the imperfect ventilation of schoolhouses has had much influence in the causation of the consumption of later life.

At first I thought I could cite several cases to show the hereditary tendency of phthisis, but upon reflection think these cases may have been contracted in persons of feeble resisting powers.

To lessen the frequency of this disease would keep up the general health by every hygienic measure and avoid the contagion which is probably chiefly in the sputa and may be active when dry.

Think there is no necessity for rigid isolation if sufficient care is taken of the sputa. Would not allow a confirmed consumptive to sleep with another person. Would disinfect the sputa, or cremate it.

Predisposed families should pay especial attention to hygiene. Have never seen a recovery from phthisis after it has become well developed.

An open-air life and nutritious diet is the best that can be done for patients who cannot have a change of climate. Change of environment, if it can be secured early enough, may ward off the disease.

W. B. PORTER, M. D.

Phthisis. — Cases of this disease are not very frequent in Walpole, and never have been, nor in Alstead, where I formerly practiced for many years. As far as I have been able to investigate the subject, I am quite sure the theory that the *bacillus tuberculosis* is the cause of phthisis seems very consistent, and I think a new and better era has opened, in which we may study the cause and treatment of phthisis with great hopes of lessening its terrible mortality. It is my opinion that the most important predisposing causes are a lack of proper sanitary conditions, uncleanliness, impure air, improper food, and too much dampness in the air; also extreme physical exercise. It is a very nice point to draw the line of comparison between imperfect ventilation and dampness as a factor in the causation of this disease, because they are very closely connected usually, but if they are to be separated, I should place the greatest stress upon imperfect ventilation.

I do most positively believe that our schoolhouses have, in the past, been a prolific cause of this fatal disease later in life, because the loss of vital powers, caused by the derangement of the physical system of the child, renders the person more susceptible to the bacillus in after years.

I think I knew several families in my early practice where the unsanitary conditions were the great cause of the repeated cases of consumption. In those days we called it "a hereditary influence," but I ask why this influence should be confined to a single family, while all the relatives outside, upon both sides, were free from the disease?

I have known a family where the sanitary conditions, so far as cleanliness was concerned, seemed all right, in which the children to the number of seven all died of consumption, and the disease also appeared in the next generation; but in order to give a satisfactory delineation I should have to go back many years in the history of the family. I am pretty strong in my belief that the disease in the cases just mentioned was due to infection, because there was no care taken to disinfect the sputa or to isolate the patients, the healthy members of the family sleep-

ing with the infected and caring for them without any regard for the consequences.

To prevent the spread of phthisis I would recommend all those sanitary measures which are now adopted in all epidemics of infectious diseases.

After expectoration has begun I would not allow a tuberculous patient to sleep with another person nor expose others to his breath. They should have separate clothing, towels, etc., and separate eating utensils. Most assuredly I would disinfect the sputa, and would have the attendant see that this is done in a complete manner.

Families predisposed to develop phthisis should avoid all influences that weaken or derange the vital forces; should observe the very best sanitary rules; should nourish and support the assimilative powers, and have an abundance of pure air; avoid dampness of atmosphere or soil, and have proper physical training.

I have observed complete recovery in cases that presented all the physical signs of the last stages of phthisis. These symptoms disappeared and the person regained a robust, normal condition in all respects, and died of some other malady.

I think consumptives can have a course of treatment at home that is quite as beneficial to them as traveling among strangers and in a foreign climate, especially if the patient is low and feeble. In this condition he needs the care of kind friends to minister to his wants and their love and sympathy to cheer his mind.

GEORGE A. BLAKE, M. D.

Phthisis. — Cases of this disease are not very common in my practice. Have to rely upon the testimony of investigators rather than upon personal observation in regard to the causation of the disease by the *bacillus tuberculosis*. Have never seen the bacillus.

Am of the opinion that damp, impure air, unhealthful diet, and uncleanliness are the most common predisposing causes of phthisis, apparent facts to the contrary notwithstanding.

Isolation, to a certain extent, is desirable in the treatment of all cases of sickness. Certainly I would disinfect the sputa.

Persons predisposed to phthisis should give particular attention to cleanliness and diet. Have never observed a complete recovery from this disease.

WASHINGTON (EAST) — SULLIVAN COUNTY.

GEORGE N. GAGE, M. D.

Topography. — The soil is a gravelly loam generally; but little sandy soil. In parts of the town the soil is rather wet and heavy, although there is but little clay. The geological formation is granite, generally in the shape of bowlders, but ledges are by no means scarce. The surface is decidedly hilly, four fifths, I should say, being hill, the remaining one fifth being about equally divided between flat and swamp land. There is not much stagnant water.

Phthisis. — This disease is quite frequent in my practice. I have supposed that there are two forms of *phthisis pulmonalis*, viz., tubercular and non-tubercular. The former, I am quite of the opinion, is caused by the presence of the *bacillus tuberculosis*, while the latter I have supposed was not, being secondary to some other disease, as bronchitis, pneumonia, etc. Heredity I should place first among the predisposing causes. People afflicted with scrofula are more prone to the disease than others. Both imperfect ventilation and dampness may act as exciting causes to produce the disease in a person predisposed to it.

Am of the opinion that the imperfect ventilation of schoolhouses has no more influence in the causation of the disease than has bad air elsewhere, — and not so much as badly ventilated sleeping-rooms.

To prevent the spread of the disease, the sputa should be very carefully destroyed. Consumptives should expectorate into cups containing paper, sawdust, or any other combustible material, and the contents should be emptied into a hot fire at frequent intervals. In case of diarrhea, disinfect discharges.

Would not isolate the patient, with the possible exception of not allowing him to occupy the same bed with another.

Families having a hereditary tendency to develop the disease should reside, if possible, on high land, where the air is dry, and in a latitude where the climate is mild. They should live out-

doors as much as possible, exercise very actively; a little hard work on a farm is better than a bicycle, and the same is true of walking.

I recollect no case of complete recovery unless the disease was in its incipient stage, and in that case my diagnosis may have been wrong. I believe the disease, when once well developed, is seldom, if ever, cured.

Patients who cannot secure a change of climate should have fresh air, which may be had almost anywhere, and, especially, a life in the open air; good, wholesome, nutritious food, particularly fatty food; exercise as far as the strength will admit, and cheerful company.

Webster — Merrimack County.

HENRY DODGE, M. D.

Topography. — The soil is rather light and sandy along the Blackwater river; loam on the hills. About three fourths of the acreage is hill land; the remaining one fourth is about equally divided between flat and swamp lands. There is not much stagnant water.

Phthisis. — This disease is not exceptionally frequent in my practice. I believe the *bacillus tuberculosis* is the cause of phthisis. Damp localities, poor ventilation, improper care of the health, and inherited tendency to weak lungs are probably among the most common predisposing causes of consumption. Am of the opinion that imperfect ventilation and dampness have about an equal influence in the causation of the disease.

The imperfect ventilation of schoolhouses has undoubtedly weakened the general health of very many pupils, and thus rendered them susceptible to consumption, or some other form of disease, determined, perhaps, by the inherited tendency of the family.

I would recommend that persons with weak lungs avoid consumptive patients as much as possible. I would recommend the disinfection of the sputa; it can certainly do no harm, and I think the sputa is very frequently the means of transmitting the disease.

Families having a tendency to develop phthisis should live as

much as possible in the open air. If practicable, they should leave New England for a more favorable climate. They should avoid persons known to have the disease, and give special attention to general hygiene.

I think I have observed complete recovery from phthisis in one or two instances.

When physicians and the people have obtained a thorough understanding of the disease much will have been accomplished toward the reduction of its large mortality.

Wentworth — Grafton County.

FREEMAN A. DURKEE, M. D.

Topography. — The surface of the 23,040 acres included within the boundary lines of Wentworth is, as compared with that of neighboring towns, moderately level, although sufficiently diversified to form some very attractive and beautiful scenery. A large amount of this territory lies in the valley of Baker's river. The soil is good, and when properly cultivated produces fine crops of all kinds. The geological formation is mica, slate, copper, gold, iron, limestone. There is about an equal amount of hilly and flat land and but very little swamp land. Little or no stagnant water.

Phthisis. — This disease is not very common in my practice. In many cases I believe the *bacillus tuberculosis* is the cause of the disease. Am of the opinion that heat and colds are the most common predisposing causes. Probably about one third of the cases are induced by imperfect ventilation and dampness. Think the imperfect ventilation of schoolhouses has had no influence in the causation of consumption in later life.

To limit the disease, would recommend abstinence from stimulating drinks, good food, cleanliness, regularity in sleeping and eating, and moderate exercise.

I am not prepared to say how far tuberculous patients should be isolated, but would recommend the disinfection of the sputa.

Families having a hereditary tendency to develop phthisis would do well to emigrate to some climate more favorable than that of New England. Have never seen a complete recovery from this disease.

Whitefield — Coös County.

GEORGE S. GOVE, M. D.

Topography. — The soil is porous, but there is a firm hardpan at the depth of two feet. The geological formation is granite; slate crops out occasionally, together with sandstone. The surface is mostly hilly. The level or flat land is very scarce and exists only in small quantities. We have but a few acres of swamp land in town, and but little stagnant water.

Phthisis. — This disease is not very common in my practice. The weight of evidence at the present time seems to favor the theory that the *bacillus tuberculosis* is the cause of phthisis, more particularly among young people. The most common predisposing cause seems to be a hereditary tendency to phthisis; the fact that relatives have died with the disease impresses the minds of persons of certain temperaments that they will die of the same disease, and then come in the depressing influences of hardships, anxiety, disappointments, improper food, insufficient clothing, debilitating habits, and all other things that lower the general standard of health.

In this locality I have seen but little trouble from imperfect ventilation. Dampness and cold together I should consider one of the greatest causes of the disease; but dampness and warmth, with good ventilation, I should consider preventive in persons inheriting a tendency to phthisis.

I attended a lady in confinement who was suffering from phthisis. She rallied from the confinement for a few days, then the old cough returned and she sank lower and lower and in about four months died. The child was of medium size, fairly developed, and for a few weeks seemed to do well; but gradually it developed a cough and survived the mother only a short time. This was the most marked case of hereditary transmission I have ever witnessed.

Where practicable I would have tuberculous persons room and sleep by themselves, and if the patient were able would have him care for his own room; but would have some one to see that the secretions and everything about the room were properly attended to, and that the bed and room were properly aired and ventilated. I would disinfect the sputa, also the dejections.

Families having a hereditary tendency to develop phthisis should wear flannel next the skin the year round. I would have them take plenty of exercise, having some object in view other than the warding off or curing disease, in order to reap the most salutary influence. They should have an abundance of good, plain, well-cooked, nutritious food in which the nitrogenous and hydrocarbonous elements are well represented. Avoid late hours and large gatherings in poorly ventilated rooms. Cultivate a cheerful, happy disposition, and look on the bright side of life.

Have never seen a recovery in a well-marked case of phthisis. Patients who cannot secure a change of climate should have good food, properly prepared, and the younger invalids should partake of foods in which the fats, in such form as can be best relished, are well represented. Flannels should be worn next the skin both summer and winter. Keep the feet warm; exercise in the open air. Secure thorough ventilation of the sleeping-room during the day and do not close the doors and windows too closely at night. Abstain from the use of tobacco, strong tea and coffee, and liquors of all kinds if the appetite is good; if the appetite is not good, I would permit the use of alcoholic spirits, well reduced, in small quantities just before food is taken.

In houses where phthisis has prevailed, I would take the rugs and carpets from the floors and so arrange them in the room, together with the curtains, beds, bedding, furniture, and clothing of the patient, that the fumes of burning sulphur could permeate every part of them. Have a safe and suitable iron vessel with some charcoal and a sufficient amount of sulphur for the size of the room to be fumigated. Set the charcoal on fire, close the room as tightly as possible, and keep it closed from twelve to twenty-four hours. The paper should then be taken from the walls and burned. The house should then be closed again and the doors opened from room to room and the whole thoroughly fumigated from the cellar, allowing the fumes of the sulphur to rise through every part, even to the attic. The house should then be opened, thoroughly aired, and cleaned with soap and water from cellar to attic. Rooms occupied by consumptive patients should be washed, floors and walls, with a 500 per cent solution bichloride of mercury. After this, paper and paint the walls and

floors, whitewash the ceilings, and replace the furniture, etc., and there need be no more fear of phthisis in this than in another house, provided all has been thoroughly done in every particular.

WINCHESTER — CHESHIRE COUNTY.

GEORGE W. PEIRCE, M. D.

Topography. — The geological formation is granite and the soil is such as is always found with such a formation. There is not more than one acre of flat land to five hundred acres of hill, and not more than one tenth of an acre of swamp to same. Very little stagnant water.

Phthisis. — This disease is not common in my practice. I believe the *bacillus tuberculosis* to be an incident rather than the cause of phthisis, and heredity the most common predisposing cause. Imperfect ventilation and dampness, either or both, impair vitality, and whatever reduces the tone of the system incites the development of latent or hereditary faults. Do not believe the imperfect ventilation of schoolhouses has any influence in the causation of consumption in later life. Have seen any number of cases illustrating the hereditary tendency of phthisis.

Have known a wife to die of phthisis where the husband had died of the same disease, but whether it was due to infection or inoculation is a serious question. To prevent the spread of this disease I would forbid by statute the intermarriage of all persons having the taint of phthisis in their blood, and would divorce all such now begetting offspring.

I would relegate every tuberculous person to absolute celibacy, and would otherwise isolate such cases so far as I could and be humane. I would cremate the sputa. I would do everything I could to prevent persons having a tendency to phthisis from falling into a debilitated state.

Have observed what appeared to be complete recoveries from this disease. Those patients who cannot secure a change of climate should have a generous diet, warm clothing, and protection from atmospheric changes.

To reduce the large mortality from this disease, I would have no more offspring from consumptive parents.

In addition to the foregoing reports by the physicians of New Hampshire, we present herewith a communication from one of the most eminent and well-known physicians of this country, Dr. Henry I. Bowditch, of Boston, Mass., who kindly complied with a request to present his views upon the subject. Dr. Bowditch has for many years made a special study of pulmonary consumption, and is, perhaps, regarded as the highest authority upon this disease in New England.

PETERBOROUGH, N. H., August 20, 1890.

To the State Board of Health of New Hampshire:

GENTLEMEN, — At the request of Dr. Chase of this town, I have prepared these answers to your questions relative to consumption, and which you have addressed to the physicians of the State. Without this special request from Dr. Chase, I should not have felt authorized to offer to you any opinions on the various questions. I rejoice to know that your board is investigating, as thoroughly as it can, the matter of consumption, and I wish heartily your success.

Respectfully yours,

HENRY I. BOWDITCH, M. D.,
113 BOYLSTON STREET, BOSTON.

BOSTON, MASS.

Topography. — Boston (Trimountain its original name) was built upon three hills, Beacon, Copp's, and Fort Hill. The space between them was loamy, arable, but the city was originally almost wholly surrounded by water, sea and river, and connected with the mainland at Roxbury by a long, narrow neck. Beacon Hill has been much lowered, and Fort Hill wholly removed, to make land around the city limits. More than fifty years ago a milldam was erected in a line direct with Beacon street and from Charles street, and a large empty basin from the dam to the neck, and from Charles street, at the bottom of the "common," out to Roxbury, was then formed. Thus, for many years, the empty basin was an immense tract of wet land, on which no houses could be built. About a quarter of a century since, it was decided to fill up this whole tract with clean country gravel, ten or fifteen feet in height. Upon this being done the whole has been laid out with wide streets, and Commonwealth avenue. This territory now contains all the chief residences. Save upon some portions of its edge towards Roxbury, where the soil is still

uncovered and is low and damp — some of it really unfit for human residences, — the whole tract is now believed to be eminently proper for them.

Phthisis. — I have seen more of phthisis than of almost any other disease, but my patients, especially of late years, have not been confined to the city. I should say that the city is not especially liable to consumption. But as I do not deem the city as healthy as the country for consumptives, because it is exposed to the winds and dampness and coldness of Massachusetts Bay, I usually advise all patients who can do so to move ten or twelve miles into the country and choose a residence on a dry, southern slope, open all day to the sun. I have seen unequivocal physical signs of lung disease disappear, and patients get well, or live many years, when this rule has been followed, which, I think, would not have been the case had they continued to reside in Boston.

1. Tuberculous Bacillus. — I believe that the *bacillus tuberculosis* is the cause of the "miliary tubercle," because in each miliary granulation is found a bacillus. It is generally found in other forms of consumption, because this micro-organism, floating about as it does in most atmospheres, always seizes, as the place for its own life, any diseased or abraded spot of the animal body. The fact that laparotomy in a case of tubercular peritonitis, in which are found myriads of these germs, cures the otherwise fatal disease, makes me less fearful of the bacillus than some writers of the present day seem to be. Some seem to think that isolation is as necessary in consumption as it is in scarlatina, measles, or other infectious diseases. Doubtless it is well to disinfect and destroy all sputa from patients with phthisis in order to prevent the bacilli usually found in it from becoming dry in an apartment, and then floating into the air passages or to the diseased or abraded spots in other persons.

2. Predisposing Causes. — Any course of life which tends to lower the vitality, such as overwork, either bodily or mental, especially in a confined atmosphere, any residence over a damp soil or cellar, any very dusty trade, as stone-cutting, knife-grinding, etc., any liability to sudden changes of temperature or exposure to drafts of cold air, as in some trades, any undue and long-continued contact with a consumptive, as in sleeping with a consumptive hus-

band, wife, sister, brother, or friend, especially if during the day the attendance is continued. For the patient's sake, I always order that none should sleep with him or her. Separate beds, and, if possible, not in the same but in an adjacent room, I always advise. Heredity I believe an important predisposing cause.

3. Imperfect Ventilation. — I have seen no case in which I could prove that ill ventilation of a house produced consumption, and yet I have no doubt that it is often a prime factor in the gradual deterioration of health, thus making one more liable to consumption. I think I have seen the advantages of healthy outdoor life (i. e., good ventilation) in preventing consumption. I had one very significant case several years ago in which I thought I saw great advantage result from what the majority of physicians would deem excessive if not absolutely harmful ventilation.

The case was that of one of the most eminent of American surgeons. About thirty years since he consulted me for repeated hemoptysis — cough, etc., — and he had a fine crepitus for some time, mostly throughout the left breast. I supposed that he had miliary tuberculosis of the lung, and looked upon the case as probably to be eventually fatal. Yet he has recovered wholly, and looks well. He determined virtually to have fresh air always, day and night. At night, summer and winter, he has slept with his window usually wide open, and he got well. I submit the case for the frank consideration of your board.*

4. Dampness. — Years ago, in an address before the Massachusetts Medical Society,† I was able, I think, to prove that residence on a damp soil is a potent cause of consumption in Massachusetts. Three years afterwards, Dr. Buchanan, of London, discovered the same law. Since then, Dr. Pepper and others have proved the same law to exist in their own localities. I am now so sure of this truth that I will never consent to treat a patient unless he will remove from such a damp locality. I generally advise patients to go to some dry climate, as Colorado, Minnesota, North Carolina mountains, or New Mexico, and live

* The above patient died this year and marks of former tubercular disease — but cured — were found at the apexes of both lungs.

† Massachusetts Medical Society Transactions, May 28, 1862; also, same published by Ticknor & Fields, Boston.

there. But this great change is not absolutely necessary. The removal of a few miles, or even less, I require as a prerequisite for any other treatment. And this short distance seems, at times, as useful as a distant migration.

5. Imperfect Ventilation of Schoolhouses in its relation to Consumption. — I cannot answer this question of schoolhouse ventilation positively; but I have seen not a few cases subjected to over-study in close schoolrooms, especially where the constitutions were frail, and when the persons paid little attention to the necessity for an outdoor life, that have, soon after leaving school, become fatally diseased with phthisis. Poor ventilation, however, was only one factor in such cases.

6. Unsanitary Conditions. — These cause many and most severe evils, but not especially consumption, so far as I know, save in the points covered in my answers to previous questions.

7. Heredity. — I cannot now give any cases, but I have no doubt that children of tuberculous parents are more liable to have phthisis than others. This opinion, I know, is disputed by those who believe that the bacillus is the sole cause of consumption, and one writer has said that it is absurd to talk of the micro-germ being transmitted. My answer to this objection is: 1. No one has the right to say that the bacillus, which can circulate everywhere when once in the human body, may not be transmitted to the human ovum, as the germs of syphilis or of some other diseases are. 2. If the bacillus itself cannot be transmitted, a low state of constitutional traits may be caused, thu rendering the progeny of consumptive parents much more liable to the introduction of the germ than is a child of perfectly healthy parents. 3. Whatever reasons may be given in opposition, my whole professional experience sustains the doctrine of the hereditary nature of consumption. Notwithstanding this belief in the tendency of consumption to transmit itself to the child of consumptive parents, I have in my own family a proof that by persistent, active, outdoor life, always carried out, consumption can be cured at times in the parent, and prevented from occurring during three generations of persons descended from two consumptive parents.*

* See Communication to the Climatological Society, by Henry I. Bowditch, at a meeting in Boston, 1889; also Medical News.

8. Infection.— I have seen cases in which persons sleeping with others, husband with wife, sister with sister, etc., especially when one is the other's attendant during the day, have had consumption after the sick one has died. I feel so sure that in these cases the disease has been "caught" from the invalid that I always require a separate bed for the invalid, and, if possible, an adjacent room rather than a bed in the same room with the invalid. I should consider it folly, and almost a crime, to attempt to treat a consumptive patient unless this rule be obeyed. I put this law in operation as my first prescription, and to make it seem less severe, I order it on the ground of good to the patient, who needs fresh, unbreathed air, rather than for the friend's sake. But I always warn the latter of the great danger of persistently disobeying the advice.

While thus believing in the infectiousness of phthisis in certain cases, I do not believe in it to the extent that some seem to since the discovery of the bacillus, nor that consumption is to be regarded as infectious and contagious as scarlatina, small-pox, etc. I have no sympathy with the apparent "scare" that prevails in the minds of some writers on this subject.

9. Sanitary Measures to Prevent Consumption. — Let all cities and towns be thoroughly subdrained. Non-residence on a damp soil for all. Plenty of fresh air, simple, substantial food, and open-air exercise will, I think, sometimes prevent the disease from occurring in persons predisposed to consumption. When a consumptive is in a house it should be daily well ventilated, and sputa should be received in some disinfecting fluid and soon destroyed by fire. It should not be thrown where it can dry and allow infectious bacilli to float in the air. In choosing a profession or trade, one of feeble health should select an occupation which will require active outdoor exercise, rather than sedentary, indoor, or dusty trades or employments of any kind.

10. Isolation. — In my answer to the eighth question may be found, perhaps, all that I have to say on this. I do not believe it necessary to have special hospitals to which all consumptives should go, as some have advocated, as we have for undoubted infectious and contagious diseases.

11. Disinfection of Sputa. — It should always be done.

12. What Measures to be used in a Family predisposed to the Disease. — From earliest years a daily sponge bath in luke-warm or cold water, as preferred, with thorough drying by friction of the body afterwards. Plenty of good, substantial food, meat twice or three times daily, and active outdoor exercise; avoidance, if possible, of frequent "cold-taking." When older, continue these rules, and in choosing a trade or profession, take one which will be active rather than sedentary, and require outdoor exercise rather than too much confinement to the house, especially close or ill-ventilated rooms; no trade with dusty atmosphere inherent to it, as iron or streel grinders', stone workers', etc. (See note on seventh question, as to my own family experience.)

13. Recovery, Ever?— I have no doubt of recovery taking place at times, but rather from hygienic measures, however, as indicated in my previous answers, than from most specific remedies, although some of these last, hypophosphite of lime syrup, cod liver oil, fusel oil, etc., and, I have no doubt, sometimes whiskey, have been of essential service. This last, however, I never prescribe as a constant remedy, for fear of perhaps making a drunkard even if I cure the patient, and we cannot always promise that result even with whiskey. The hope of a cure depends much on the slight or severe nature of the disease. I have thought that disease at the base of the lung is more favorable than that of the apex. (See note to seventh question, and address before Climatological Society for undoubted cure of my father by hygienic measures, in a drive for several weeks in an open chaise, and subsequently a five or six miles' walk daily for rest of life, i. e., thirty years.)

14. What Measures for those who Cannot Travel far. — Going to live upon a dry hill having a southern slope, and, if possible, in a house rather defended from violent cold northern and eastern winds, where plenty of open air and food above alluded to can be procured. This spot may be very near the actual residence, and yet will be more healthy for a consumptive. With this change, I have known patients to improve generally, and the cough lessen under syrup of the hypophosphite of lime, taken three times a day.

15. Measures to Reduce the Mortality.—Let towns look to their localities, and have them thoroughly subdrained. Let commons and parks be opened to induce the inhabitants to walk and drive in them. Let children have open playgrounds. Let every schoolhouse have its gymnasium room, and a certain amount of bodily exercise be carried out morning and afternoon systematically, so that there may be healthy bodies as well as developed minds. (See answers to questions 2, 3, 7, 8, 12, 13.)

It would seem almost superfluous to attempt any analysis of or to make any extended remarks upon the foregoing reports, since they are so direct and complete in themselves. There are, however, certain opinions expressed in a few individual cases that we could not indorse.

The chief causes and the preventive measures to be employed in this disease may be briefly summarized, in the light of our present knowledge of the disease, as follows :

1. Pulmonary phthisis is the most fatal disease known to civilization.

2. The *bacillus tuberculosis* is generally believed to be the cause of the disease.

3. The disease, when developed after the first years of childhood, is acquired and not inherited, although there may be an inherited predisposition which renders the subject incapable of resisting the invasion of the bacilli.

4. The disease is liable to appear at any period of life.

5. That there is great danger arising from the use of tuberculous meat and milk. From the evidence which has been gathered, we are led to believe that the liability to infection from these sources is very great, and to insure public protection in this particular, the State should exercise a careful supervision of our milk and meat supplies.

6. That the greatest danger of infection is from the sputa of the consumptive. For this reason, when confined to the house, a spit-cup or spittoon should be used, and when upon the street a handkerchief to receive the expectorations. The spit-cup and spittoon might preferably contain a disinfectant, but if these ves-

sels are frequently and thoroughly cleansed with boiling water, disinfectants are not an absolute necessity. The handkerchiefs used should be immersed in boiling water at least daily, before the sputum has become dried.

7. No person should occupy a sleeping-room with another who has tuberculosis, although many persons escape infection under such conditions.

8. The eating utensils of a consumptive should be washed in boiling water, and care should be exercised that the same glasses, spoons, etc., are not, before being washed, used by children and others. The patient should also avoid kissing others or placing in his mouth any article likely to be used or handled by others.

9. The dejections of consumptive patients, in cases where the bowels are affected, should be thoroughly disinfected.

10. Perfect cleanliness of the apartments occupied by consumptives should be urged in all cases. The bed linen, towels, etc., should be very frequently put through the operations of the laundry, while the walls should be frequently cleansed and dressed anew. In fact, the whole question of restriction may be expressed in the one word "cleanliness."

SANITARY REPORTS FROM LOCAL BOARDS OF HEALTH.

We have deemed it advisable and as a matter of record to secure, as far as possible, a sanitary report from each town and city in the State, and herewith present a summary of the same. A blank containing the following questions was prepared and sent to each local board of health in the State :

THE STATE OF NEW HAMPSHIRE.

1890.

SANITARY REPORT

OF THE LOCAL BOARD OF HEALTH OF ——, N. H., TO THE STATE BOARD OF HEALTH. BY ——.

[The following questions relate chiefly to conditions existing in villages and cities. It is not expected that exact answers can always be given; if not, give an approximate answer or an estimate. The information sought is for the purpose of securing as complete a sanitary report as possible for publication, if deemed advisable, in the next annual report of this Board.]

1. Water-Supply.

(State exact source of supply, whether from wells or distribution pipes. If from public supply, is it furnished by the town or by a private company? What is the quality? Is it ever discolored? Is it bad at any season of the year? Does it contain iron? Is it hard or soft? Is it ample in quantity? Is the supply from which it is taken of undoubted purity? If a public supply does not already exist, is one contemplated in the near future?)

2. Sewerage.

(Are there any sewers for the purpose of conveying sewage from the houses? Is there a complete system? If so, what proportion of the houses are connected

therewith? Are the sewers well flushed? What proportion of the dwellings depend upon cesspools for sink drainage? Are the cesspools well cemented, or have they open sides and bottom?)

3. Drainage.

(Is your town well drained? Is the water-level low enough to secure dry cellars? Are there low lands or swamps near the village? Give particulars.)

4. Slaughter-Houses and Offensive Trades.

(Are there any such that constitute a nuisance? Are regulations enforced to prevent slaughter-houses from becoming a public nuisance? Are there any other offensive trades in your town? If so, state particulars.)

5. Schoolhouses and Public Buildings.

(Are these well heated, lighted, and ventilated? In the construction of new schoolhouses is especial attention given to these points?)

6. Fire-Escapes.

(Are there sufficient fire-escapes in connection with hotels, public halls, etc.? Are the doors of new public buildings constructed to swing outward, as the law requires?)

7. Health Laws and Regulations.

(Does your town adopt and issue health regulations? Does your board make occasional sanitary inspections, or does it act only upon complaints received?)

8. Contagious Diseases.

(Does your board make a monthly report to the State Board of Health? Do the physicians promptly notify you of the existence of contagious diseases? Do you placard infected houses? Do you prohibit public funerals in deaths from diphtheria and scarlet fever? Do you require disinfection of houses in which these diseases have occurred?)

9. Sanitary Improvements.

(State what sanitary improvements have been inaugurated within the past year.)

10. Sanitary Needs.

(State the sanitary needs of your town. Upon this subject a full statement is particularly desired.)

11. Sanitary Suggestions and Remarks.

(Under this head state anything of importance touching the sanitary interests of your town.)

12. Local Board of Health.

(Give names and addresses in full.)

13. Has your town a board of health, or does the board of selectmen act in that capacity?

Responses were received from nearly every town, although in a few instances there has been a failure to do so, even after a second and third request from this Board.

These reports will be of both local and general interest. Many of them show that their respective towns are in a very creditable condition, while some others are open to criticism. There are some explanations and suggestions which we desire to offer for the purpose of calling the attention of local health officers to certain points that have been either misunderstood or ignored:

1. It will be noticed that many towns do not adopt health regulations. Now, while the duty of issuing such health regulations is often left to the health authorities, we believe it advisable for each town to establish and promulgate such rules and regulations, not solely for the guidance of health officers and the public, but also as a means of education for the people upon sanitary matters. Health regulations, posted or circulated through the town, call attention to existing unsanitary conditions and in this way lead to reforms. The law regarding health regulations is as follows:

The health officers may make regulations for the prevention and removal of nuisances, and such other regulations relating to the public health as in their judgment the health and safety of the people may require, which shall take effect when they shall be approved by the selectmen, recorded with such approbation by the town clerk, and published in some newspaper printed in the town, or copies thereof posted in two or more public places in the town. And any person willfully violating such regulations shall be punished by a fine of ten dollars for each offence. — G. L. c. 111., s. 1; P. L. 1887, c. 62, s. 4.

The State Board of Health may make, in addition to the rules and regulations of local health officers, such other rules and regulations, or may make such amendments to existing rules and regulations, as in the judgment of the Board the public good may demand, and such rules and regulations shall be enforced by the health officers in the same manner as other health regulations. — P. L. 1885, c. 14, s. 2.

Health officers or local boards of health shall furnish the State Board of Health with such information as may be called for from time to time concerning the work of such health officers or local boards of health, and a copy of all rules and regulations issued by such health officers or local boards of health shall be forwarded to the State Board of Health when issued.— P. L. 1885, c. 14, s. 3.

2. In the matter of contagious and infectious diseases it is noticeable that many towns have utterly failed to comply with the provisions of the law in spirit or in letter. This criticism is also applicable to some physicians of this State as well as to some non-resident physicians who practice here. The law requiring physicians to report every case of diphtheria, scarlet fever, or any other malignant disease, is as follows:

> It shall be the duty of every physician who attends upon any person infected with the small-pox, the malignant cholera, diphtheria, scarlet fever, or any other malignant, pestilential disease, to immediately report the same to the health officers or the selectmen of the town; and if any physician shall neglect so to do, he shall forfeit the sum of one hundred dollars, to be recovered by such health officers or selectmen in the name of the town. — P. L. 1887, c. 23, s. 1.

The object of requiring such a report to be made to the health officer is that he may be able to take such precautionary action as will prevent the spread of the disease. In many towns such measures are promptly carried into effect, while in some others the practice is substantially as reported in the following: "We never placard infected houses, nor is disinfection required by the board of health in cases of diphtheria or scarlet fever; but it is generally done by the family." A few towns report that they do not prohibit public funerals in deaths from diphtheria or scarlet fever, but require the family to disinfect the premises afterward. A more absurd and useless course could not be followed. It is the duty of the local health officer to see that every case of contagious or infectious disease is effectually quarantined from the public; to prohibit public funerals in deaths from malignant contagious diseases, and to superintend the thorough and effectual disinfection of the premises where any such disease has occurred. Disinfection as practiced by the average family, who are totally ignorant of its requirements, is worse than useless. Disinfection should be performed by a person who understands something of the principles involved and that simply to deodorize is not to disinfect. But in a case that is not quarantined, where friends visit the patient at their pleasure and where public funerals are allowed, disinfection is a useless farce. The prompt enforcement of judicious health regulations has

done much to stamp out this class of diseases in this State as well as elsewhere. We commend the consideration of this subject to those few health officers who have failed to perform their duty in this particular. The regulations concerning public funerals in contagious diseases, issued by the State Board of Health and distributed to every board of health in the State, are as follows:

"By virtue of the authority vested in the State Board of Health by section 2 of chapter 14, Pamphlet Laws, 1885, it is hereby ordered that, in the rules and regulations adopted by any town or city board within the limits of the State of New Hampshire, the following shall be inserted and included, and that no rule or regulation which will in any way impair the meaning or force of the same shall be adopted by any town or city:

"1. No public funeral shall be held in any instance where the deceased died of small-pox, scarlet fever, or diphtheria.

"2. No pupil shall attend any school, public or private, from a house or family where there exists a case of scarlet fever or diphtheria, unless such case or cases are thoroughly isolated from the said pupil, and then only upon the certificate of a physician, certifying to the fact that such isolation is secured, and that in his judgment no liability to spread the disease will follow.

"3. No person who has had scarlet fever or diphtheria shall attend any school or other public gathering until three weeks after convalescence has been established, except upon the certificate of a reputable physician."

3. Some health officers report that they have ordered certain nuisances to be abated, but that no attention was paid to the order. In such cases it becomes the duty of the health officer to enforce his order in accordance with the law. A tax collector who should notify a citizen of the amount of tax assessed against him and then not collect it, even though there should be some objection, would not be considered a suitable man for the office. Neither is a man who fails to enforce his orders a suitable person for a health officer. The law, both statutory and common, is ample to cover all the orders which a health officer is ordinarily called upon to enforce. If there is sufficient ground for issuing an order, there can be no excuse for not enforcing it.

4. There seems to be some misapprehension on the part of many local health officers concerning the monthly reports of contagious and infectious diseases to be returned to the State Board of

Health. We desire monthly reports, upon blanks furnished by this Board, from every town and city in the State, whether contagious diseases are prevailing or not. Many health officers have thought it necessary to report only when contagious diseases were prevailing, but a negative report conveys definite information and gives assurance that local boards are performing their duties. These blanks will be furnished upon application.

5. Some local boards have reported that their towns are small and sparsely settled, and that they have no sanitary needs. According to some of the conditions described, this would appear to be somewhat of a commentary upon their knowledge of sanitary requirements.

An examination of the following reports will show that most excellent sanitary work has been accomplished, even in some of our smaller towns, Pittsburg, for example. This town has made regular monthly reports to the State Board of Health for a long time, and has demonstrated the fact that an efficient local board of health may be of great benefit to any town, however small. If a man who has been chosen health officer cannot see how he can be of public service to the people, he had better resign his office at once, and allow his place to be filled by some one who has a better comprehension of the duties of the position.

6. An examination of the reports received reveals the fact that in many instances where no board of health has been appointed or elected, the board of selectmen are totally oblivious that they constitute the board of health under such circumstances. Some of them were ignorant of the fact that they have the power to appoint health officers if they deem such action for the best interests of the town. The law upon this subject is as follows:

> Any town may choose, by major vote, one or more agents, overseers of the poor, firewards, and health officers. If such officers are not chosen, the selectmen shall discharge the duties and have the powers of those officers. — G. L. c. 40, s. 4.
>
> The selectmen of any town that has neglected to elect a health officer or officers may appoint one or more health officers for said town, as in the judgment of the selectmen may be necessary; but if no health officer or officers shall have been elected or appointed, it shall, upon the petition of ten or more legal voters, be the duty of the selectmen to appoint one or more health officers, as in their judgment may be necessary. — P. L. 1885, c. 14, s. 1.

If the selectmen fail to appoint, the law holds them responsible as health officers. A board of selectmen is usually elected for other duties and is not often particularly qualified to act as health officers. We recommend that the boards of selectmen in all cases appoint a health officer in those towns that fail to elect such officers at the annual town meeting.

While certain towns richly merit the above criticisms, we have only words of praise for those other health officers who have accomplished such an excellent work in the interests of sanitation and the public good. This work is not here mentioned in detail, because it shows for itself. Among those towns that have made substantial improvements, in the construction of sewers, etc., may be mentioned Franklin, North Stratford, Claremont, Berlin Falls, Nashua, Pittsfield, Boscawen. Other towns have under consideration additional water-supplies for domestic purposes, and still others realize the necessity of a pure water-supply, but are not able financially to provide it. Sewers and water-works will be constructed in these towns as rapidly as possible.

Good sanitary progress has been made in the cities of the State. Dover has at last abandoned her "penny wise and pound foolish" policy and provided a reasonable salary for her health officer. We sincerely hope that Nashua and Portsmouth will follow her example. It is only a few years since Concord has had a regularly salaried health officer, during which time more and better sanitary work has been done than in a decade before. A glance at the report of the Concord board of health will convince any one of the value of their work. Good work is also being done in Manchester and Keene by their respective boards of health.

ACWORTH — *Population*, 717.

BOARD OF HEALTH. — J. Leavitt McKeen, George W. Buss.

Each individual family is supplied with water, either from springs through lead pipes, or from wells by means of various kinds of pumps. The quality of the water is very good. We have no sewers, but most of the dwellings have very good sink drainage. The town is naturally well drained, and cellars are dry; there are no swamps near the village.

We have no slaughter-houses constituting nuisances, nor any other offensive trades. Our schoolhouses have been recently repaired, and are in good condition.

Our public halls have no fire-escapes, and the doors swing inward.

This town does not issue health regulations, and the board of health acts only upon complaints. Our board does not make monthly reports to the State Board of Health. Physicians promptly notify us of the existence of contagious diseases. We should prohibit public funerals in deaths from scarlet fever and diphtheria, and should require disinfection of infected houses.

There have been no sanitary improvements in town during the past year; think we do not need anything in that direction at present.

ALBANY — *Population*, 377.

BOARD OF HEALTH. — David Hurley, Anson P. Irish, Alvah Blakely, *Selectmen*.

There is no public water-supply; no system of sewerage or drainage.

There are no slaughter-houses.

Schoolhouses are well ventilated and lighted, for they are out of repair. We have a new chapel almost done.

There are no fire-escapes.

The board of health acts only upon complaints.

The board of health does not make a monthly report to the State Board. We have had no contagious diseases, but would certainly require the disinfection of any house in which such diseases might occur. Public funerals would also be prohibited in such cases. We have no physicians in town.

No sanitary improvements during the year.

We need a man to look after the burial of the dead in our locality, and the town will see to this matter at the next election.

ALEXANDRIA — *Population*, 679.

BOARD OF HEALTH. — Warren Tucker, J. E. S. Walker, C. L. Plumer, *Selectmen*.

The water-supply is from wells. We have no sewers.

The town is well drained; there are no swamps.

There are no slaughter-houses in town.

I am sorry to say that some of our schoolhouses are too well ventilated and lighted, and therefore poorly heated; but new houses are constructed according to the most approved plans.

We have no fire-escapes in connection with public buildings.

The board of health acts only upon complaints.

Our board does not make a monthly report to the State Board of Health. We have had but one case of a contagious disease in town, and our board was not notified of that.

No sanitary improvements during the year; do not think any are needed.

ALLENSTOWN — *Population*, 1,475.

BOARD OF HEALTH. — John H. Sullivan, William D. Marden, William H. Haseltine, *Selectmen*.

The water-supply is mostly from wells, and generally very good, as the soil is of a sandy and gravelly nature. In the village portion of the town the China Corporation is supplied from an inexhaustible spring, some 100 to 150 rods from the buildings; the water is of extra quality. We have one private water company, whose pipes run through the main street, furnishing Suncook Village and a few takers on the Allenstown side with soft water, which is considered to be of good quality; the source is a spring in a pasture.

There are no sewers in town, and, as in most communities, there are places which are not kept as neat as they should be. The farming community in general keep their premises quite clean, and the drainage good; some portions of the village are not in so good a condition.

The town generally is well drained, and the cellars are mostly dry, owing to the nature of the soil. There are no swamps about the village, as the Suncook and Merrimack rivers offer good drainage.

No slaughter-houses or offensive trades in town.

Our schoolhouses are in good condition; they are neat and clean, are well heated, lighted, and ventilated. Our schools are small in numbers.

There is one large hall in town, and it is well constructed. It

is easy of ingress and egress, there being three exits in case of fire, and the doors swing outward.

We have issued no health regulations, but notify parties in case of any nuisance, which is usually attended to without further trouble.

We have not made monthly reports to the State Board of Health, as there has been no occasion for doing so. The physicians have no cases to report, — at least, they do not notify us of any cases. Have never had occasion to placard houses.

There have been no sanitary improvements during the year, except to keep the grounds as clean as possible.

We have notified the proprietors of China Mills to keep the vaults and grounds about their buildings clean and in good condition, and think they are disposed to do all they can in this direction. The Canadian population generally are not as neat as the American part of the town.

ALTON — *Population*, 1,372.

HEALTH OFFICER. — George P. Miller.

The water-supply is furnished by a private water company; we have, also, a few wells. The quality of the water is good at all seasons of the year; is soft, and never discolored.

We have no sewers. Have no cesspools, and none are needed, on account of the sandy and gravelly nature of the soil.

The cellars are dry; no swamps.

Slaughter-houses are situated a suitable distance from dwellings.

The old town house is a perfect gem.

No fire-escapes, and the doors to our public buildings swing inward.

This board issues no regulations, and acts when called upon.

No monthly report is made to the State Board of Health. Physicians report promptly in cases of infectious and contagious disease, but we have had none for a long time. We prohibit public funerals in deaths from diphtheria and scarlet fever.

No sanitary improvements to report.

During the hot weather, the Boston & Maine Railroad station at this village gives us a fearful stench. The hotels are not properly ventilated.

ANTRIM — *Population*, 1,248.

BOARD OF HEALTH. — I. G. Anthoine, M. D., A. B. Crombie.

The water-supply of Antrim is from wells. The water is generally hard, contains some lime, and in dry seasons many of the wells become dry. A committee has been chosen to consider the matter of a public supply from some pond, but no report has yet been made.

We have no sewerage system. Only a very few dwellings depend upon cesspools for sink drainage.

The town is well drained, with the exception of South village, which needs street drainage very much, the cellars of many of the houses being wet in the spring and fall.

We have no nuisances in town.

The schoolhouses are in good condition, especial attention having been given to heating, lighting, and ventilation.

We have adopted health regulations, but have generally acted upon complaints received.

The board has not made a monthly report to the State Board of Health; there have been no infected houses in any of our villages this year. Public funerals are prohibited in deaths from diphtheria and scarlet fever, and disinfection is required where these diseases occur.

No sanitary improvements have been inaugurated within the past year.

Street sewerage is needed from Clinton street to the top of the hill, past the Goodell Company Cutlery Manufactory, except for a short distance in front of the schoolhouse and churches, where street sewers already exist.

ASHLAND — *Population*, 193.

HEALTH OFFICER. — A. R. Garey, M. D. (Appointed.)

The water-supply is from distribution pipes, furnished by private individuals who have wells or springs. I should say one half the water-supply is from wells, through pipes, and the other half from springs. Lead pipe is used, from which I have had four severe cases of lead poisoning within a few years. The water is hard, but never discolored. The sources of the water

are usually on high ground, hence I judge it is quite pure; it is abundant in quantity, and never have any trouble with it except from its distribution through lead pipes. There has been talk of a town water-supply from a pond some three miles distant, but nothing but talk has resulted thus far.

We have no system of sewerage whatever. Very few houses near the river have sewers, and ninety-nine per cent of the dwellings depend upon cesspools for sink drainage. More than seven eighths of all the cesspools are simply large holes in the sandy soil, having neither sides nor bottoms cemented.

The town is not well drained, but the water-level is sufficiently low to secure dry cellars. There is but little swamp land near the village. The river runs through the center of the town, and good drainage might be readily secured. We have had twenty-five hundred — yes, three thousand — dollars raised within the past two years for sidewalks, but not one cent for drainage, or for water-supply, to insure against fire.

We have no slaughter-houses which constitute nuisances; have not had occasion to enforce regulations in such cases since 1882. No other offensive trades in town, except rum-selling.

We have a fine schoolhouse, which is well heated, lighted, and ventilated. Town hall the same.

There are no fire-escapes connected with any building in town. Doors of the schoolhouse and town hall swing outward.

No health regulations are issued in this town. The health officer makes inspections only upon complaints received.

Make no monthly report to the State Board of Health. I am promptly notified of contagious diseases, but have not as yet been obliged to placard infected houses; should do so if anything like diphtheria, scarlet fever, or small-pox should occur. I require disinfection of houses in which the above diseases appear.

No sanitary improvements whatever during the year.

The position of eight tenths of all the houses in this town is such that complete drainage could easily be secured, and the need of such a complete system is very great. If this were done, a public water-supply would be necessary, and this could be brought from a pond some three miles distant, and at a cost not more than double the amount we have expended for concrete

sidewalks within two years. Therefore, a public water-supply and a complete system of sewerage are what we should have to insure good health to our people and to cut down the fire insurance one half. I wish there were laws to enforce a system of thorough drainage for every village.

ATKINSON — *Population*, 483.

BOARD OF HEALTH. — Edward N. Greenough, George A. Page, John K. Mason, *Selectmen.*

The water-supply is from wells.

Do not know of any cemented cesspools for the purpose of sink drainage. Most of the drainage from sinks is conducted through stone or wooden gutters.

There are low lands near the village. Many of the cellars are damp, and some of them contain water in the spring of the year.

There are no slaughter-houses in Atkinson.

Three schoolhouses, recently built, are well lighted, heated, and ventilated. The other two houses in town are of an ancient type, and not so well ventilated.

We have no hotels, and no fire-escapes. Have no public buildings with doors swinging outward.

Our board acts only upon complaints.

There is no resident physician in Atkinson, the practicing physicians being residents of Massachusetts. In only one instance has the board of health been notified of the existence of a contagious disease; there was one death from diphtheria. The house was placarded and a private funeral was held.

No sanitary improvements during the year.

The town is somewhat sparsely settled. I do not know of anything that would improve the sanitary condition, except, perhaps, drier cellars in some instances, and disconnected farm buildings.

It seems to me that it is a mistake to connect farm buildings, where a large number of cattle are kept entirely in the barns through the winter months, with a large quantity of manure in the barn cellars. Nearly all the farm buildings constructed during the past twenty years are thus connected. It seems to me

that outbuildings should in no instance be joined to a dwelling, particularly if a large stock of cattle, hogs, and horses is to be kept.

AUBURN — *Population*, 631.

BOARD OF HEALTH. — Alfred D. Emery, Samuel Richardson, B. S. McDuffee, *Selectmen.*

The water-supply is from wells; have never had occasion to analyze the water.

We have no sewerage system. There are a few cesspools in town; some of them are properly constructed, and some are not.

The town is well drained, with the exception of a few cases in Auburn village, where the owners claim they cannot drain their cellars on account of the high water-level of Massabesic lake. There are low lands and swamps near the village.

We have one slaughter-house, which is kept in good condition.

Our schoolhouses are well lighted, heated, and ventilated.

We have but one hall in town; no fire-escapes, and the doors swing inward. In the construction of the new schoolhouse, the doors were made to swing outward, and especial attention was also given to heating, ventilating, and lighting.

The town adopts and issues health regulations. The board of health makes occasional inspections, and also acts upon complaints.

We have made monthly reports to the State Board of Health previous to the present year, and intend to do so promptly in the future. The resident physicians make a prompt report of infectious and contagious diseases, but non-resident physicians cause some trouble on account of their delay in reporting. We placard houses whenever necessary, also disinfect them. Public funerals are prohibited in cases of death from contagious or infectious diseases.

During the past year the board of health has co-operated with the health officer of Manchester in his efforts to prevent the pollution of the waters of Massabesic lake.

As a large part of the watershed of Massabesic lake is situated in the town of Auburn, and is becoming more and more of a summer resort, some measures will be necessary to protect the

waters from pollution. The same conditions, or worse, exist in relation to that part of the watershed which is within the limits of Manchester.

BARNSTEAD — *Population*, 1,264.

BOARD OF HEALTH. — Rufus S. Foss, Ira L. Berry, John H. Knowles, *Selectmen.*

Our water-supply is from wells, and is of good quality. Have no sewers; the township is well drained by rivers. No slaughter-houses or offensive trades. Schoolhouses are well lighted, heated, and ventilated. We do not adopt health regulations, and the board of health acts only upon complaints received. We do not make a monthly report to the State Board of Health, and have no contagious diseases in town. There have been no sanitary improvements during the year.

BARRINGTON — *Population*, 1,408.

BOARD OF HEALTH. — W. E. Waterhouse, Freeman Varney, G. B. Haley, *Selectmen.*

The town is supplied with water from wells of good quality at all seasons of the year, generally soft, abundant in quantity, and considered pure. No public supply is contemplated at present.

There are no sewers; some of the dwellings depend upon cesspools with open bottom for sink drainage. The natural drainage of the town is good, although there are two swamps near the village connecting with the river. There are no offensive trades in town.

The schoolhouses are in a good sanitary condition, well heated, lighted, and ventilated, and in those constructed recently, especial attention was paid to these points. The doors of all the public buildings erected lately swing outward, and sufficient fire-escapes are provided in connection with the hotels and public halls.

The town has never adopted any health regulations, and the board of health acts only upon complaints received. The physicians promptly notify the local board of any existing contagious diseases and proper precautions are taken in all cases; placards are placed on infected houses, and private funerals are required

in deaths from diphtheria and scarlet fever, while disinfection is ordered for any houses sheltering either of these diseases. No sanitary improvements have been undertaken during the past year and there are no especial needs in that direction at present.

BARTLETT — *Population*, 1,247.

BOARD OF HEALTH. — Edwin Ground, M. D., L. J. Frink, M. D.

The town of Bartlett is supplied with water by a private water company, and while I have never known of its being subjected to a chemical analysis, I consider it good water. The source is well above the village, and presumably above sources of contamination. The water is sometimes discolored after heavy rains; it is soft and contains no iron that I know of.

We have no sewers. The sewage from dwellings is usually discharged into cesspools or into streams; the cesspools usually consist of holes dug in the ground and not cemented, but occasionally a large barrel, with holes in the sides and bottom, is sunk into the ground. Owing to a high water-level in some parts of the town, it is difficult to secure dry cellars; as a rule, however, the cellars are dry. There are some low lands near the village. No slaughter-houses or offensive trades in town. Our school-houses are fairly well heated by stoves and very well lighted. There is no ventilation, except by means of doors and windows. Our fire-escapes are thought to be ample.

Our town adopts no health regulations except the state health laws. Sanitary inspections are generally made only upon complaints; this is not the invariable rule, however. Think our board does not make a monthly report to the State Board of Health. The physicians generally report contagious diseases quite promptly. Houses are usually placarded and disinfected, and public funerals are prohibited in deaths from such contagious diseases.

We have made no especial sanitary improvements during the year. We need a system of sewerage, or some other provision for drainage. A good active epidemic, to awaken the people to the importance of keeping their premises in a reasonably clean condition, would do much toward improving our condition. Sewers are needed more than anything else in the line of sanitary improvements.

BATH — *Population*, 935.

HEALTH OFFICER. — Edward S. Randall, M. D. (Appointed.)

The water-supply is mostly from springs; but very few wells in town. The quality of the water is of the best; it is hard, but of undoubted purity. No public supply is contemplated, individual springs furnishing all that is required.

We have no complete system of sewerage. About one half the houses are furnished with sewers, and these are well flushed. About half the dwellings depend upon cesspools for sink drainage; but these are not cemented, and have open bottoms and sides.

The natural drainage of the town is very good, the water-level being sufficiently low to secure dry cellars. I do not know of a wet cellar in town. No low lands or swamps near the village.

There is one slaughter-house in town that is a public nuisance. It is within three rods of the public highway. The board of health was called upon to look after a lot of about twenty hogs that had died of some contagious disease and were left in a pile upon the top of the ground. The owner would not take care of them, so they were buried by the board of health at the owner's expense. Something will have to be done with this place before another year, for it is a public nuisance, and we have regulations under which we can cause its abatement.

Our schoolhouses are not so well ventilated as they should be, and I think something should be done in this direction. The heating is by the old method of stoves.

Our fire-escapes are sufficient. Doors of public buildings swing outward.

We adopt health regulations, but the board of health acts only upon complaints.

I think we have not, as a rule, made a monthly report to the State Board of Health; but we do expect to notify you in case of any contagious disease. I had two cases of diphtheria in June, before I became a member of the board, but the disease occurred in Lisbon, and not in this village. Public funerals are prohibited in deaths from diphtheria and scarlet fever, and we require the disinfection of houses in these diseases.

There has been but little sanitary improvement during the year, but much should be done soon.

Something should be done to secure a better or more complete sewerage system. Our schoolhouses must, and I think will, be improved before another year.

I think, upon the whole, that, with the abatement of the slaughter-house nuisance and a few minor improvements, our village will be in as good a condition as others of same number of inhabitants.

There have been no cases of typhoid fever in town this year thus far, and but two cases of diphtheria, and those were due to bad sink drainage in the town of Lisbon. Both cases recovered.

BEDFORD — *Population*, 1,102.

BOARD OF HEALTH. — Henry H. Smith, J. E. Gault, Milton N. Flint, *Selectmen.*

Our water-supply is from wells; the quality is good. No public supply is contemplated.

The town is so thinly settled that sewers are deemed unnecessary. Cannot say whether the cesspools are cemented or not. The town is well drained; the water-level is low enough to secure dry cellars. No low lands or swamps near the village. There are no slaughter-houses or offensive trades in town that constitute nuisances, therefore there is no necessity for enforcing any laws in regard to them. All our schoolhouses are well lighted, heated, and ventilated. No fire-escapes are provided for public halls, etc., but the doors swing outward as the law directs.

The town has adopted health regulations, but the board of health acts only upon complaints received. Monthly reports have not been made to the State Board of Health during the present year, since there has been nothing to report. Physicians report contagious diseases when they exist, and houses are placarded and disinfected. Public funerals are prohibited in deaths from contagious diseases.

There have been no sanitary improvements during the year. In almost every instance each family attends to its own sanitation, otherwise the selectmen have charge of the matter.

BELMONT — *Population*, 1,142.

BOARD OF HEALTH. — Charles E. Small, Walter C. Wells, Brock Dearborn, *Selectmen.*

Our water-supply is from wells in some cases, but the larger part is brought in numerous small aqueducts from a hillside near the village, and is good at all seasons of the year. It is ample in quantity, and soft. We have no system of sewerage.

The town is naturally fairly well drained, and the cellars are nearly all dry; there are no swamps near the village. No nuisances near the village.

Our schoolhouses are well heated and well lighted, but the ventilation is not of the best. There are proper fire-escapes at the mills, but not at public buildings.

The town does not adopt health regulations, and the board of health acts only upon complaints received. We do not make a monthly report to the State Board of Health, but the physicians notify us of the existence of any contagious disease, and in such cases public funerals are prohibited, and the houses disinfected. There have been no sanitary improvements during the year, and there is no pressing need of any.

BENNINGTON — *Population*, 542.

BOARD OF HEALTH. — F. M. Twitchell, C. H. Kimball, George A. Gray, *Selectmen.*

Our water-supply is from wells, and from an aqueduct owned by an individual of the town; the water is of good quality, and conducted through iron pipes. The source is a spring one mile from the village. Think there is none better in the State.

There is no system of sewerage, and no regularly constructed cesspools, — at least, none cemented. As a rule, the drainage is good; we have no swamps of any size. No slaughter-houses. Schoolhouses are well heated, lighted, and ventilated. We have no new public buildings, but the inside doors of the town hall swing outward; there are no fire-escapes.

The town does not adopt health regulations, and the board of health acts only upon complaints. As you already know, we do not make monthly reports to the State Board of Health. We

have no resident physician, but depend upon two at Antrim. One of these has never reported to us, and the other reported one case of typhoid fever last year. There have been no cases of diphtheria or scarlet fever in town since we have been upon the board, — at least, no deaths therefrom.

There have been no sanitary improvements within the year. We think it would be for the interests of the town to have a board of health other than the selectmen, as they have business enough to attend to.

BENTON — *Population*, 244.

HEALTH OFFICER. — George H. Clark.

We have a plentiful water-supply from springs and wells, and a quantity of fine brooks running down from the mountain sides.

I think there are no cemented cesspools in town, but the drainage is very good, for the land is not level.

No slaughter-houses in town. Schoolhouses very good. Should act upon complaints, if any were received. Do not make a monthly report, but am particular in regard to contagious diseases. No sanitary improvements; no sanitary needs.

BERLIN — *Population*, 3,729.

HEALTH OFFICER. — H. C. Rowell.

At the upper end of the village a number of families are supplied with water from an aqueduct, the water being conducted from a spring through wooden logs; this is excellent water, and is owned by the Berlin Mills Company. Thirty or forty families, known as Fibreville, are supplied from a well dug in the hillside above, the water being conducted through iron pipes; the quantity is limited, and at times water is pumped from the river to help out. I know nothing of its quality. It is owned by the Forest Fibre Company. About one third of the lower end of the town is supplied from a so-called spring, or brook, through iron pipes. This supply is furnished by private parties. The quantity is limited, and is much discolored during and after rains. Professor Angell made an analysis of this water, but found nothing detrimental, except too large a quantity of organic matter, apparently of a vegetable nature. The remaining families of the

town, about three fourths of the whole, are supplied from local springs and wells which must be more or less polluted. Survey and plans are being made for an abundant supply of good water.

About one half mile of main sewer has been laid by the town within the past two years; it is the best salt-glazed pipe, and is thoroughly flushed. Fibreville was sewered by the owners, but they have no flushing arrangement. We have no complete system of sewers, although almost every dwelling has some arrangement for carrying off sink-water; cesspools are almost unknown.

While the town is not thoroughly drained, it is favorably situated to secure good drainage and dry cellars. There is not a great amount of low or swampy land. We have no slaughter-houses or offensive trades in the town.

There are three schoolhouses in the village; one is heated by steam and the other two by stoves. I think they are well lighted. Two of them are ventilated by means of flues in the chimneys; whether or not it is thorough could only be ascertained by tests.

There are no fire-escapes connected with any building in town, to my knowledge. There are three public halls, in all of which the doors swing outward, according to law.

No health regulations were issued this year. Complaints are attended to as promptly as possible. Occasional inspections also are made, and nuisances abated as found. Monthly reports to the State Board of Health have not always been made. Physicians are prompt to notify in cases of diphtheria and scarlet fever, and the law has been fully complied with in these diseases. Physicians do not report other diseases. There have been no contagious diseases in town this year so far.

The main sanitary improvement has been the extension of the sewer commenced the year before, in all about one half mile. Some private drains have been put in, and a number of bad places have been filled. The town has already made a move toward complete sewerage and a public water-supply.

Our greatest sanitary need is an abundance of good water for domestic purposes, and a complete and thorough system of sewers. I think there should be some law or village regulation to prevent the erection of buildings or dwellings over wet or

swampy land unless there is thorough drainage. More light and more fresh air in some of our tenement houses would also be desirable, and there are undoubtedly cases of over-crowding.

The present sanitary condition of the town is anything but good, owing largely to the lack of water and sewerage. The pitch of the land is very favorable for the location of such works. With a population approaching four thousand, and rapidly increasing, this need is apparent to all. The people have become aroused on this subject, and, from indications, it is evident that the town will soon have an ample supply of good water, and a thorough system of sewerage. Of course a sufficient time must be allowed to carry forward the work legally and systematically. When these works are completed, the place will compare favorably, from a sanitary point, with any town of its size in the State. Until such works are established here, it will be impossible to maintain the town in a good condition, and any board of health, no matter how untiring in its efforts, will be powerless to prevent the occurrence and spread of contagious diseases.

This town is "founded on a rock," and a complete system of water-works and sewerage must be very expensive. Would it not be possible for the State, either by general or special legislation, to assist this and other towns undertaking a work of such magnitude? It seems to me that this is a question worthy of consideration.

BETHLEHEM — *Population*, 1,421.

BOARD OF HEALTH. — Benjamin Tucker, *Chairman*, Horatio Nye, Dr. H. A. Hildreth.

We have a corporated water company which supplies the compact part of the town with water from springs. The water is ample in quantity and of good quality; it is hard, never discolored, contains no iron, and is of undoubted purity.

We have a good system of sewers on the main street, where the boarding-houses are situated, and all houses are connected with the same. The sewers are well flushed. Most of the cesspools in town are cemented, and are situated back of the business part of the town.

The town is well drained; cellars are dry as a rule; no low lands near the village. No slaughter-houses or offensive trades in or near the village. Our schoolhouses are well heated, lighted, and ventilated. We have no fire-escapes, but there are spacious stairways in the hotels and halls. There is but one public hall in town, and the doors of that swing outward.

The board of health does not issue health regulations, but we make sanitary inspections. Our board makes a monthly report to the State Board of Health. As a general thing physicians promptly notify us of contagious diseases. We placard infected houses, prohibit public funerals in deaths from diphtheria and scarlet fever, and require disinfection of houses in which these diseases have occurred.

We have made no sanitary improvements during the year. As the village increases in population, and as new boarding-houses are erected, there will be additional sanitary needs, but at present we are very well off.

BOSCAWEN — *Population*, 1,487.

BOARD OF HEALTH. — J. C. Pearson, G. L. Pillsbury, J. C. Morrison, *Selectmen*.

Penacook and Boscawen Plains are mostly supplied with water through distribution pipes, by individuals and private water companies; some wells. The water is of good quality and soft, but is sometimes discolored after heavy rains.

We have some sewers for conveying the sewage from dwellings, although there is not a complete system; the sewers are not flushed. Our cesspools are seldom cemented; they generally consist of an old barrel sunk into the ground, which is worse than to discharge the sewage upon the surface of the ground where it may be subject to the action of the sun, wind, and rain. The town site is generally well drained, the water-level being low enough to secure dry cellars. Have no low lands or swamps near the village. No slaughter-houses or offensive trades in the town.

Our schoolhouses are well heated and lighted, but the ventilation is questionable. Our fire-escapes are sufficient.

The town does not adopt health regulations, and the board of health acts only upon complaints received. We make occasional

reports to the State Board of Health. Our physicians report promptly in cases of infectious diseases; we placard infected houses, prohibit public funerals in such cases, and require very effectual disinfection.

We have laid some additional sewers during the year. The town of Boscawen has put in nearly $3,000 worth of sewers within four years.

We still need more sewers, and a public water-supply to flush the same.

Bow — *Population*, 725.

BOARD OF HEALTH. — John H. Burroughs, Charles B. Rogers, *Selectmen.*

Our water-supply is mostly from wells; some of it is hard and some soft. The supply is ample and I should say it was pure. We have no system of sewerage. Our town being somewhat hilly, the natural drainage is good, and the cellars, as a rule, are dry. We have some low lands, but very little swamp land.

No slaughter-houses in town. Our schoolhouses, with one or two exceptions, are well heated, lighted, and ventilated. We have built one schoolhouse during the past year, and shall probably build two more soon. We have no fire-escapes, there being no hotel in town, and but one public hall, which is on the ground floor.

The town has adopted no health regulations, and the board of health acts only upon complaints received. We make no monthly report to the State Board of Health. Our physicians are rather slow in reporting contagious diseases. We placard infected houses and prohibit public funerals in deaths from diphtheria and scarlet fever; we also require the disinfection of houses in which these diseases have occurred.

There have been no general sanitary improvements in town during the year, and none seemed to be required.

We have had two cases of diphtheria in town during the year; but think it was brought here by a Frenchman coming to Bow Mills to work.

BRENTWOOD — *Population*, 967.

BOARD OF HEALTH. — William H. Glidden, Everett E. Thompson, J. Albert Robinson, *Selectmen*.

Our water-supply is from wells ; no public supply contemplated. We have no sewers. The town is naturally quite well drained, being situated on high and quite dry land. Most of the cellars are dry.

We have one slaughter-house in town about which there has been some complaint. It has been cleaned and is all right for the present. Our schoolhouses are heated by stoves. No hotels in town, no fire-escapes.

The board of health acts only upon complaints received. We do not make a monthly report to the State Board of Health ; have never received the blanks. The physicians notify us in cases of contagious diseases, and we placard infected houses and require disinfection where such diseases have occurred. Have made no sanitary improvements during the year.

BRIDGEWATER — *Population*, 332.

BOARD OF HEALTH. — Harvey W. Tilton, John H. Clay, Joseph S. Morrison, *Selectmen*.

Our water-supply is from wells and springs. There is no village or thickly settled locality in town. No slaughter-houses or offensive trades. The schoolhouse is well lighted, heated, and ventilated. Think perhaps there are not sufficient fire-escapes in connection with the Lake View Boarding-House.

The board of health acts upon complaints only. There have been no contagious diseases in town during the year. Have made no monthly report to the State Board of Health, for no blanks have been received. No sanitary improvements during the year.

BRISTOL — *Population*, 1,524.

HEALTH OFFICER. — Ira S. Chase, M. D.

We are supplied with water by the Bristol Aqueduct Company, from Newfound lake, a most desirable, bountiful, and perfectly clear water, conducted through fourteen-inch, coated and lined, iron pipes.

We have no system of sewerage, but many drains in the village lead to the river. Some of these drains are well finished and in good condition.

The town is quite well drained; have good dry cellars, as a rule. There is a wet, swampy condition of the land on the west side of the village, which needs draining.

No slaughter-houses in the village proper; no offensive trades in our village.

Our schoolhouses are well lighted, heated, and ventilated. Union schoolhouse is a fine building, heated by steam, just completed, and nearly ready for use.

Our fire-escapes are considered ample; doors of public buildings swing inward, as a rule.

We adopt health regulations, and make occasional inspections.

Some physicians report promptly in cases of contagious diseases, and others do not.

There is great need of sanitary improvements upon the west side of the village.

BROOKFIELD — *Population*, 428.

BOARD OF HEALTH. — William A. Bixby, Charles Willey, *Selectmen.*

The water-supply is from wells.

The sewage is conveyed by means of gutters by the side of the road.

The town is well drained.

There are no slaughter-houses in town.

No especial attention is given to the heating, lighting, or ventilating of schoolhouses.

No fire-escapes.

The board of health acts upon complaints only.

Have had no contagious diseases.

No sanitary improvements during the year; there is no especial need of any.

BROOKLINE — *Population*, 548.

BOARD OF HEALTH. — C. H. Holcombe, M. D., David Hobart.

Our water-supply is entirely from wells and springs. Have no complete system of sewers. Some of the cesspools have open bottoms and sides. The town is naturally well drained; no standing water in cellars, and no swamps near the village. We have no nuisances in the shape of slaughter-houses or offensive trades. Our schoolhouses are only one story in height; they are well constructed and located. Our fire-escapes are sufficient.

The town has adopted no health regulations; the board of health acts mostly upon complaints received. Our board makes a monthly report to the State Board of Health; our physicians report promptly in cases of contagious diseases; we placard infected houses, prohibit public funerals in deaths from contagious diseases, and require thorough disinfection where such diseases have existed.

There have been no particular sanitary improvements during the year; most of our people take pride in keeping their premises free from filth. More attention should be given to keeping wells, privies, and sink-drains in good condition. In many cases the drinking-water has quite an odor in hot weather, and sink-drains and privies are, in many cases, too near wells. There should be more frequent sanitary inspection of wells and cesspools, as well as greater care on the part of owners.

CANAAN — *Population*, 1,417.

BOARD OF HEALTH. — E. M. Tucker, M. D., G. E. Leet, M. D.,* B. E. Willey, M. D.

There is at present no public water-supply, but a company has been organized and is about to commence operations to bring water to the village from Hart pond, one and one quarter miles distant from and 200 feet above the village. The supply now is from private wells, or running water from springs, about fifty families in the village being supplied with the latter. There is no public system of sewerage; a majority of the residents depend upon cesspools, which are rarely cemented.

*Elected, but did not qualify.

Some low lands are located near the village, but they are not swampy; the cellars are dry the most of the year.

There is occasional complaint of a slaughter-house near East Canaan village, but it is not considered an actual nuisance. No other offensive trades in town.

The heating and lighting of schoolhouses and public buildings are good, but the ventilation is poor. No fire-escapes in hotels or public halls, although very simple and inexpensive ones have been urged by the board of health. Doors of last schoolhouse erected in East Canaan district swing outward.

The town has adopted no health regulations, and the board of health acts only upon complaint. A monthly return is made to the State Board of Health of those cases of contagious diseases reported by the physicians. We do not placard houses, nor forbid public funerals, but disinfection of infected dwellings has been required for years, before the law compelled it.

Slight improvement is made in the drainage each year, and if running water is put into every house, we shall have one of the most healthful towns in the State.

CANDIA — *Population*, 1,108.

BOARD OF HEALTH. — A. J. Edgerly, J. W. Sargent, B. F. Lang, *Selectmen.*

Our water-supply is mostly from wells. We have very few sewers, most of the sink drainage being conducted in spouts. A part of the cesspools are cemented, but most of them have open sides and bottoms. Nearly all the cellars in town are dry; those that are not are well drained. Regulations in regard to slaughter-houses are enforced, and there are no offensive trades in town. Schoolhouses are well heated, lighted, and ventilated. Fire-escapes are sufficient.

The board of health rarely acts, except upon complaints. We do not make a monthly report to the State Board of Health. Physicians report promptly in cases of contagious diseases. We do not placard infected houses or prohibit public funerals in deaths from contagious diseases, but require the disinfection of houses where such diseases have occurred. We have made no public improvements during the year. I think farmers should be

more careful about their sink drainage and cesspools; this seems to be our greatest sanitary need at present.

CANTERBURY — *Population*, 964.

BOARD OF HEALTH. — Charles E. Morrill, Alfred G. Chase, Rufus Boynton, *Selectmen.*

We report to the State Board of Health whenever notified of the existence of contagious diseases by physicians, and have known of no case that has not been promptly reported to us. Our townspeople, as a general thing, are usually healthy.

There seems to be nothing to suggest in the way of sanitary improvements. Our sanitary condition is about on a level with that of other country places. Our people seem to be growing more particular in regard to sanitary features as time advances, and have a greater realization of their necessity.

CARROLL — *Population*, 468.

BOARD OF HEALTH. — J. H. Henry, E. L. Miles, E. M. Moody, *Selectmen.*

There is no closely settled district in Carroll, — nothing approaching a village. It is principally a farming town, with a few summer hotels and boarding-houses.

We have no slaughter-houses located near the highway. Our schoolhouses are fairly well lighted, heated, and ventilated. Think there are no fire-escapes connected with the hotels.

CHARLESTOWN — *Population*, 1,466.

BOARD OF HEALTH. — R. W. Robinson, C. N. Bidwell, S. E. Noyes, *Selectmen.*

The water-supply is from springs and wells. The springs furnish pure soft water, but the wells are hard. No public supply contemplated.

The private sewers are very good; cesspools in the village are very well constructed, but the farm cesspools are about what they were one hundred years ago. The town is generally well drained. The cellars are dry, with a few exceptions. Our slaughter-houses are all right. Our schoolhouses, in some in-

stances, are on the old plan, but as fast as repairs are made they are put in good condition. We have no public buildings requiring fire-escapes.

Our board of health acts only on complaints received. We do not make a monthly report to the State Board of Health. Physicians report promptly in cases of contagious diseases, houses are placarded, public funerals in deaths from such diseases are prohibited, and disinfection of the houses required.

We have made no sanitary improvements during the year. Our greatest need is that the old wells at back doors be filled up, and a good supply of pure water secured for domestic purposes.

CHATHAM — *Population*, 329.

BOARD OF HEALTH. — Dana Hill, William Spencer, Daniel Chandler, *Selectmen.*

We are supplied with water from springs on the mountain side, or from wells on the farms. We have no public supply.

Most of the farms are situated upon the side-hill, and the sewerage is good; no cesspools in town that I know of. The town is naturally well drained; no low lands or swamps in town, neither is there a slaughter-house in town. Our schoolhouses are all right.

The town does not adopt health regulations. We have no contagious diseases in this town.

We have made no sanitary improvements during the past year, and do not need any. We have no sanitary needs. We are all right as far as health is concerned.

CHESTER — *Population*, 958.

HEALTH OFFICER. — Arthur L. Emerson, M. D.

Our water-supply is from wells; have no system of sewerage. The town is naturally very well drained. Cellars are dry; no swamps or low lands near the village. Have no slaughter-houses or offensive trades creating nuisances. Schoolhouses are well lighted, heated, and ventilated. Fire-escapes are sufficient for the place. This town does not adopt health regulations, and the board of health acts only upon complaints. This board does not make a monthly report to the State Board of Health. Our phy-

sicians report promptly in cases of contagious diseases. Have never placarded infected houses or prohibited public funerals in deaths from contagious diseases, but require disinfection of houses in which these diseases occur.

There have been no sanitary improvements during the year, and none are needed at present.

CHESTERFIELD — *Population*, 1,046.

BOARD OF HEALTH. — Warren H. Butler, Ira P. Buxton, Calvin P. Gilson, *Selectmen.*

There is no public water-supply in town ; each family supplies itself, either from springs or wells. The quality of the water is first-class, usually soft. No public supply is contemplated.

I think the sewerage is good, although there is no complete system of sewers. As a general thing, the cellars are dry and the drainage good. We have one slaughter-house, but I hear no complaint that it is offensive.

So far as I know, the schoolhouses are well heated, lighted, and ventilated. We have several hotels and boarding-houses ; I think, perhaps, the fire-escapes in connection with them may not be sufficient.

The board of health acts upon complaints only. We have not made a monthly report to the State Board of Health. The physicians are prompt to notify us in cases of contagious diseases, although we have had no such cases in several months. We prohibit public funerals in deaths from scarlet fever and diphtheria, and order the disinfection of all houses where these diseases have occurred.

There have been no sanitary improvements in town during the past year, and at the present time do not know that we need anything to promote health and vigor.

CHICHESTER — *Population*, 661.

BOARD OF HEALTH. — N. D. Fitts, O. T. Maxfield, O. F. Davis, *Selectmen.*

Our water-supply is almost entirely from springs and wells, and, in many cases, conducted through either lead or iron pipes. We have no public supply.

In a few cases there are short sewers from sinks and water-closets; but most of the sewage is conducted from buildings in open gutters, or is allowed to fall directly upon the ground. There is no system of drainage, and know of no cesspools in town. The town is mostly on high, rocky land, consequently the natural drainage is good. The cellars are dry, and we have no swamp land to speak of.

There are no slaughter-houses in town; we have one soap factory, but there is no complaint against it.

We regret to say that our schoolhouses are not well heated, lighted, or ventilated. Our fire-escapes are ample, and the doors of public buildings swing outward, as they should.

Our town does not adopt health regulations, and the board of health generally acts upon complaints only. Our board does not make a monthly report to the State Board of Health, for there have been no cases of contagious disease in town during our term of office. We should placard infected houses and disinfect them, as well as prohibit public funerals in deaths from such diseases.

There have been no public improvements during the past year.

In our estimation, the greatest danger arises from neglected privies and wet barn cellars. There is no doubt that many wells are polluted from the above-named sources.

CLAREMONT — *Population*, 5,565.

BOARD OF HEALTH. — Isaac H. Long, Marshall S. Rossiter, Henry C. Sanders, *Selectmen*.

Claremont village is supplied with water by two private companies, the Bible Hill Aqueduct Company and the Claremont Water-Works Company. The Bible Hill water is mostly from springs, always of good quality, soft, and never discolored. The supply from the Claremont Water-Works Company is ample, and Professor Angell, in reporting an analysis of a sample, says: "There is evidently no sewage or animal matter in this water; indeed, all the results are favorable. This is good water." There are also two or three other aqueducts supplied from springs on the hills, and a few wells are still in use, although they are decreasing in numbers each year.

There is no complete system of sewerage in the town; only a small portion of the houses are connected with the sewers, two thirds or more depending upon cesspools for drainage. These cesspools are of all kinds of construction.

The town is naturally well drained. There are no low lands or swamps near the village, and the water-level is low enough to secure dry cellars.

The regulations concerning slaughter-houses are enforced, and there are none that are a nuisance to the public; no other offensive trades in town.

The greater part of the public buildings are well heated, lighted, and ventilated; especial attention has been given to these sanitary points in the construction of new schoolhouses. There is an insufficiency of fire-escapes on these buildings, but the doors of those built recently swing outward.

The board has issued health regulations, and makes occasional inspections, but acts mostly on complaint. During the hot weather, there is almost a daily call from some portion of the village on account of nuisances caused by sink-drains or excrementitious matter that has been allowed to collect and become offensive from lack of proper carefulness. At such times the board of health has always responded immediately, and usually by making a personal inspection of the premises, and in no case have they found the complaint ungrounded. During the year ending March 1, 1890, they answered over forty calls, and endeavored to see that the nuisances were properly abated. In nearly every case they found the townspeople in sympathy with their efforts and willing to right any wrong; but occasionally they met opposition or negligence, which they were forced to deal with in an authoritative manner, and always with success.

Physicians promptly notify the board of the existence of contagious diseases, and these are reported monthly to the State Board of Health. During the year ending March 1, 1890, there were reported twenty-eight cases of scarlet fever, thirty cases of diphtheria, and nine cases of typhoid fever, with a mortality of six. Infected houses were not placarded, but were disinfected, and public funerals were prohibited in cases of scarlet fever and diphtheria.

On careful examination of a sewer, it was found that no less than seven sinks emptied their contents into an old stone drain near a tenement house on North street; after consultation, a tile sewer about two hundred feet long was laid from North street to the river; about 1,500 feet of tile sewer has also been laid in another place.

There seem to be comparatively few in the village who realize the great danger to the health of the town from the lack of proper sewerage. To a great many, especially those who are accustomed to living out of the village, where there is plenty of pure air and soil to absorb the impurities which in a crowded village saturate the soil and breed disease, it seems impossible that the lack of proper sewerage can bear any but dangerous results. And it is true that many are made sick, and a great many more suffer from the effects of it while they still keep about their work. This is an evil that must be remedied, and the longer it is put off the more sickness and death will be recorded against it. Whether it should be done at the expense of the town as a whole, or at the expense of a portion of it, it is not for this board to say; but we would urge the town to make a beginning in the matter at once, and then press forward to its completion as fast as possible.

There is another nuisance in the village which should receive the immediate attention of the public, — the accumulation of waste, filth, and vegetable matter, thrown into the ditches by the roadside, in or near the outskirts of the village, which not only makes an unsightly place, but is a breeder of filth and disease, and should be removed at once by proper means, however arduous. There are a few owners of houses and blocks who persist in keeping their premises and surroundings in a filthy and unhealthful condition, but, happily, they are few in number.

CLARKSVILLE — *Population*, 325.

BOARD OF HEALTH. — Willis Harriman, Charles W. Wiswell, Horace Comstock, *Selectmen*.

The water-supply is from springs among the hills, and is good. We have nothing in the way of sewers. Our town is naturally well drained, and the cellars are dry. No slaughter-houses in town. Our schoolhouses are well lighted, heated, and ventilated. No hotels or public halls in town.

The town has not adopted health regulations, and the board of health acts only upon complaints received. Our board makes a monthly report to the State Board of Health. We have no cases of infectious diseases, hence no infected houses, and no occasion to enforce any regulations.

There have been no public sanitary improvements during the year, and there is no need of any at present.

COLEBROOK — *Population*, 1,736.

BOARD OF HEALTH. — James B. Erskine, M. D., Albert Barker, Esq., Edward E. Twombly, M. D. (Appointed.)

Our water-supply is furnished by distribution pipes from a large fountain owned by a private individual. The water is never discolored or bad at any season of the year; I think it contains no iron. It is ample in quantity, and is from a source of undoubted purity.

We have a sewer through the main street only, and but few of the houses are connected with it. During the dry season this sewer is not flushed, and it empties on to the sandy bottom of a nearly dry stream. Three fourths of the dwellings depend upon cesspools, or have open drains (often under pantry windows), which are the birthplace of thousands of midgets, and give rise to a disagreeable odor. The sanitary condition, so far as sewers are concerned, is very bad. Our town is not well drained, but it easily might be.

The two slaughter-houses in town are located some distance from the village, and cause no trouble. Our schoolhouses are rather ancient, but perhaps as good as the average in the inland country towns. No fire-escapes connected with any building in town, and the doors swing inward in every instance.

The board of health acts only upon complaints received. We do not make a monthly report to the State Board of Health, since we have had no diphtheria or scarlet fever during the past three years. Should require the disinfection of houses if such deseases should occur.

There have been no sanitary improvements during the year.

Our greatest need is a board of health that shall know what a sanitary condition is, and one that should be paid for services

rendered. I, as chairman of the present board, have tried many times to bring about needed improvements, but in vain. We receive no compensation for our services, and cannot be expected to devote much time to needed inspections. Many privies are without vaults, and are so situated on side-hills that during a heavy or long-continued rain the contents are washed down to many a well and cellar below. To my mind, there should not be an open sink-drain in town.

COLUMBIA — *Population*, 605.

BOARD OF HEALTH. — Benjamin F. Jeffers, Royal W. Jordan, Wilbur A. Marshall, *Selectmen*.

The water-supply of the town is almost entirely from springs, and is pure, soft water, with no mineral or metal tendency whatever; in one or two instances, the well-water is somewhat hard.

There is no village in the town and therefore, no need of public sewers. The town contains no hotel, blacksmith shop, rum-hole, or anything of the kind, nothing but quiet, peaceful citizens, requiring no extra sanitary labors to preserve good health.

CONCORD — *Population*, 17,004.

BOARD OF HEALTH. — G. P. Conn, M. D., E. N. Pearson, E. A. Clark, M. D.

HEALTH OFFICER. — Henry A. Rowell.

The water-supply is owned and furnished by the city of Concord, and is taken from Lake Penacook, two miles north of the city, in cement-lined pipes. The quality and purity are considered equal to any in the country; it is soft water, and very seldom discolored, although it sometimes has an unpleasant taste in the summer. It lacks pressure on high ground when there is a large draught of water; a plan is now under discussion for the extension of the plant to Walker pond, Boscawen, in order to increase the pressure of the present head to eighty-five pounds to the square inch.

The city has a very good system of sewerage, and about three fourths of the houses are connected with it. It is being extended each year, a large sewer for the west part of the city being now

in process of construction. The flushing is not as frequent as it should be in the dry season. Comparatively few houses depend upon cesspools for sink drainage; those in use are generally barrels sunk into the ground, with the bottom open and holes bored in the sides, so that the water soaks into the soil.

The city is very well drained; there are some low lands and swamps, which have had sewers extended to them, thus draining the land and flushing the sewers. Only a small portion of the cellars of dwellings are damp.

The slaughter-houses are nearly all well outside the city limits; the only complaint of offensive odors from any such trade has been concerning the works of the Page Belting Company, on the road from the city to East Concord.

Especial attention has been paid to heating, lighting, and ventilation in the construction of new schoolhouses, and, as a whole, this class of buildings is in very good sanitary condition. There are very few public buildings that have fire-escapes, or doors swinging outward, although the latter particular has been observed in the erection of the new schoolhouses.

The city has adopted and issued health regulations; the board of health has made only occasional inspections from house to house, as complaints and inspection of sewers have occupied the greater portion of the time during the past year.

The number of requests for investigations, and complaints of existing nuisances, with the causes therefor, since January 1, 1890, are as follows:

Bad well-water	6
Bad drainage	9
Damp cellars	11
House sewers found obstructed by stoppage	31
Sewer pipes found open where lead pipe connected with Akron	16
Defects in sewers	14
Dumping rubbish	6
Offensive manure heaps	21
Stagnant water found in cellars	24
Dead animals ordered to be buried	11
Filthy privies ordered cleaned	131
Filthy stables	21
Filthy yards	33
Glandered horses ordered to be killed	4

Offensive catch-basins	32
Offensive cesspools	9
Accumulated vegetable matter	21
Keeping hens	6
Keeping hogs and pigs	9
Offensive sink-drains	44
Dropping manure in the streets	7
Filthy water-closets	26
Total number of complaints and requests	492

SANITARY INSPECTIONS.

The work of inspection has not been from house to house this season, owing to the large number of complaints and to the work of inspecting the new sewers. The buildings inspected since January 1, 1890, are as follows:

Private houses	168
Tenement houses	298
Stables	64
Stores	41
Hotels	4
Business blocks	6
Fish markets	2
Total number of buildings inspected	583

In 421 of these cases, the premises have been visited the second time to ascertain if the orders had been heeded, and in some instances a third and even a fourth inspection has been made.

There have been 671 written notices issued, embodying orders and suggestions in cases of the following natures:

Abatement of nuisances	94
Cleaning of vaults and privies	106
Providing water-closets	294
Connecting with the public sewers	142
Removal of hogs	12
Removal of manure heaps	17
Removal of hens	6

There have been 184 cases in which vaults and privies have been removed and water-closets substituted, and eighty water-

closets have been put into new houses built this year. These closets have been set in the following classes of buildings:

Private buildings	105
Tenement houses	146
Blocks	5
Public buildings	2
Boarding-houses	6

Inspections have been made of the following lateral sewers connecting with the main sewer:

Length of 5-inch Akron pipe	3,932
" 6 " "	966
" 8 " "	216
" 4 " "	90
" 10 " "	50
" 6-inch cast-iron pipe	160

Making a total of 5,414 feet, as used in eighty-four lateral sewers, or an average of about sixty-four feet in each.

The classes of premises thus provided with sewer connection by lateral sewers are as follows:

Private dwellings	43
Tenements	84
Stores	6
Stables	4
Schoolhouse	1
Fish market	1
Police station	1

Since January 1, 1890, there have been abandoned and discontinued the following number of cesspools, surface drains, and other offensive conditions of drainage:

Cesspools	22
Surface drains	31
Old wells used as cesspools	4
Drains discharging under stable	9
Sewers relaid with larger pipe	6

The board of health makes monthly reports to the State Board of Health of all contagious diseases returned by the physicians, but only a few of the physicians notify the board of the existence of such diseases. Placards are used in cases of diphtheria and

scarlet fever, and public funerals are prohibited. Disinfection of the houses containing the cases has been required in many instances.

The city needs two or three licensed parties to do night-work in cleaning vaults at a fixed price, which would insure good work and apparatus, and would silence complaints now made to the board of health.

CONWAY — *Population*, 2,331.

HEALTH OFFICERS. — S. A. Evans, M. D., Conway; J. C. Pitman, M. D., North Conway; John B. Nash, Esq., Conway Center.

The water-supply of Conway village is at present from wells, many of which are doubtless contaminated. The Conway Aqueduct Company is now completing its organization, and will probably supply citizens with water of undoubted purity before frost closes the ground again.

A brook flowing through the center of the village serves as a sewer. The large hotel, the mills, and some private residences drain into this brook. The majority of families, however, allow their sink drainage to spread itself, at its own sweet (?) will, upon the surface of the ground; in many instances it soaks into the ground in close proximity to the wells. The village is naturally tolerably well drained. The cellars are mostly dry, except along the shore of the mill pond, — one street is near the pond, and the cellars in this street have more or less water in them in the spring. Other parts of the village are higher, and on dry, sandy, and gravelly swells, by which good drainage is easily secured.

We have no slaughter-house nuisances; the board of health has regulations governing such. Our schoolhouses are far from being well heated, lighted, and ventilated. The problem of perfect heating and perfect ventilation has not yet been worked out here. We have no fire-escapes, but the doors of public buildings swing outward.

The board of health has issued a set of health regulations; we also make occasional inspections and act upon complaints received. We make a monthly report to the State Board of Health;

our physicians are prompt to report cases of contagious disease; we placard infected houses, prohibit public funerals in deaths from contagious diseases, and require the disinfection of houses where such diseases occur.

The principal sanitary improvement inaugurated during the past year is the supplying this village with pure water by the Conway Aqueduct Company. This company is now actively engaged in the preparation of the reservoir and the laying of pipes. Professor Angell, of Derry, pronounces this to be the purest and best water for public supply that he has ever examined.

The chief sanitary needs of this village, as well as of the other villages of the town, are: 1. A proper system for the disposal of sewage; 2. Proper ventilation of public and private buildings.

As stated above, there is a general lack of appreciation throughout the town of the importance of care in the disposal of sewage; and, consequently, the leachings of sink-drains, privies, barn and stable yards and cellars, cesspools, manure heaps, etc., are allowed to soak away into the ground, whereby many wells are doubtless contaminated. In my opinion, the important desideratum is the educating of the people to a realizing sense of the great importance of the safe disposal of sewage and of the perfect ventilation of buildings; also a knowledge of the means necessary to secure the same.

CORNISH — *Population*, 954.

BOARD OF HEALTH. — James W. Fitch, George L. Deming, William W. Ballard, *Selectmen*.

This board does not make a monthly report to the State Board of Health. Our physicians are prompt in reporting cases of contagious diseases; we placard infected houses, prohibit public funerals in deaths from contagious diseases, and require the disinfection of houses where such diseases occur. This is a farming town, and the duties of the board of health are confined to the care of an occasional contagious disease.

Our people need to be awakened to the importance of sanitary improvements.

DALTON — *Population*, 596.

BOARD OF HEALTH. — Aldrich Johnson, George Carpenter, David Hurlburtt, *Selectmen.*

Water-supply of the town is from wells, springs, and surface water. There is no village, hence no public system of sewers. The town is naturally well drained, and contains no slaughter-houses or other offensive buildings. The schoolhouses, the only public buildings, are well heated, lighted, and ventilated.

The board of health acts only upon complaint, has inaugurated no sanitary improvements during the past year, and knows of no particular sanitary needs in the town.

DANBURY — *Population*, 683.

BOARD OF HEALTH. — Harry G. Dean, John Wells, Frederic Huntoon, *Selectmen.*

The water-supply of the town is chiefly from wells; a few dwellings are supplied from springs, connected with the houses by lead pipes. There is no system of sewerage, nearly all the houses depending for drainage upon cesspools with open sides and bottom.

There are some low lands near the village, but they do not hold stagnant water, and the town is generally considered well drained. There are no offensive trades.

The schoolhouses are all old buildings, and have, with a few exceptions, no modern improvements, being only fairly well heated, lighted, and ventilated. No public buildings have been built recently, and those in existence have no sufficient fire-escapes.

The town has no established health regulations, and the board of health does not report monthly to the State Board of Health.

No sanitary improvements have been made during the past year; the general health of the community is good, but in regard to water-supply and the disposal of sewage, the existing conditions are certainly capable of improvement. In sinking wells for water-supply, the main object seems to be to obtain a sufficient quantity, and easy of access, in utter disregard of sanitary surroundings. Many times they are sunk in hollows where they receive the wash of barnyards and outbuildings, and often the

cesspool and well are within a few feet of each other. Sewage is disposed of in the easiest manner possible, frequently being emptied under windows, where every breeze carries the stench into the dwelling. Such unsanitary conditions, existing not only in this town but in the majority of the rural districts, should be changed for the better at once.

DOVER — *Population*, 12,790.

BOARD OF HEALTH. — Charles A. Fairbanks, M. D., *City Physician*, James Fogerty, *City Marshal, ex-officio*; Charles M. Jones, *Executive Officer*.

The water-supply of the city is furnished by the Dover Water-Works Company, a city corporation, formed in 1888. The water is taken from Willand pond, is of good quality at all seasons of the year, and ample in quantity; it is soft, never discolored, and of undoubted purity. Wells are also in use.

The system of sewerage is very incomplete, only about one half of the houses of the city being connected, and the sewers being flushed only by showers. The other half of the city depends upon cesspools for sink drainage, which are constructed in a variety of ways.

The city is naturally well drained, with no low lands or swamps in its immediate vicinity, and the water-level is low enough to secure dry cellars.

There are no slaughter-houses constituting a nuisance, the regulations therefor being enforced by the board of health; no other offensive trades in town.

The schoolhouses and other public buildings are well heated, lighted, and ventilated, especially the newly built schoolhouses, in two of which there is the Smead system of heating and ventilation, which gives good satisfaction, and in the new Sawyer school building the Mills system is being introduced. Not all the hotels and public halls have fire-escapes, but those public buildings constructed recently have their doors swing outward.

Health regulations have been adopted and issued, and frequent sanitary inspections are made.

The physicians promptly notify the board of the existence of contagious diseases, and a monthly report of the same is made

to the State Board of Health. Infected houses are placarded and disinfected with the greatest care, and public funerals prohibited in every case.

The new water-works, inaugurated in 1888, were finished in 1890. On the first of January, 1890, the city council passed an ordinance making the city physician and city marshal *ex-officio* health officers, and, in addition, electing a health officer with a salary of $700 per annum.

A complete sewerage system is greatly needed, and is now under discussion. It is as essential as the establishment of the water-works; the two should go together.

DUNBARTON — *Population*, 524.

BOARD OF HEALTH — Horace Caldwell, Larkin S. Page.

The water-supply of the town is from wells; the water is of good quality throughout the year, and is discolored only after heavy rains; is always ample in quantity, and is considered pure; there are a great many cisterns in town in which the water is hard, but some others contain soft water. There are no sewers in town.

Dunbarton is situated among hills, with no low land of any extent near the village; it is naturally well drained, and but few if any damp cellars. Regulations are enforced so that the one slaughter-house of the town is inoffensive.

The public buildings are well heated, lighted, and ventilated, especial attention having been given to these points in the construction of schoolhouses. The buildings have no regular fire-escapes, none of them being so large as to prevent a safe exit in case of fire; the outside doors of the town hall swing outward and inward.

No established health regulations, but strict attention is paid to the appearance of contagious diseases. A monthly report is generally made to the State Board of Health, but neglected occasionally when there have been no cases reported by physicians. Houses are placarded, public funerals are prohibited, and disinfection of the houses in which the cases occurred is required.

No sanitary improvements have been made during the year, and there seem to be no especial needs at present, as every one tries to keep his drains and outbuildings in a cleanly condition.

DURHAM — *Population*, 871.

BOARD OF HEALTH. — Daniel Chesley, Jabez H. Stevens, *Selectmen.*

We have an ample supply of hard well-water, containing little if any iron ; it is considered of undoubted purity when the wells are properly cleansed. There is no prospect of a public water-supply.

There is no sewer system ; cesspools are used in most cases for sink drainage, very few of them being cemented.

The town is naturally well drained, the water-level being sufficiently low to insure dry cellars ; there are no swamps or low lands that would affect the sanitary condition of the village. There are no slaughter-houses in an offensive condition.

Two new schoolhouses have been built recently, and all the old ones now in use were remodeled, and particular pains was taken to secure good heating and ventilating apparatus, so that they are in a good sanitary state. Hotels and public buildings are furnished with sufficient fire-escapes, and the doors of those constructed lately swing outward.

No health regulations have been issued by the board of health, but occasional sanitary inspections are made. No report of contagious diseases is made to the State Board of Health, although the physicians are prompt in notifying the board of their existence; infected houses are placarded and thoroughly disinfected, and public funerals are forbidden.

EAST KINGSTON — *Population*, 461.

BOARD OF HEALTH. — E. W. Philbrick, George F. Morrill, Frank D. Lawrence, *Selectmen.*

The water-supply of the town is from wells; there are no sewers. The town is naturally well drained ; the water-level is sufficiently low to secure dry cellars to most of the buildings; only a few houses are located near swampy land. There are no slaughter-houses that constitute a nuisance, nor any offensive trades in the town.

The schoolhouses are old, in very poor condition, not well ventilated, and a disgrace to the town. There are no hotels in

town, and the town hall, the only public hall, is on the ground floor, hence there is no need of fire-escapes.

The board of health acts only upon complaints received, or upon nuisances that come to their knowledge. Physicians promptly notify the local board of all existing contagious diseases, and when there are any such, they are reported monthly to the State Board of Health. Infected houses are well guarded, and public funerals are forbidden in cases of death from diphtheria and scarlet fever.

No sanitary improvements have been undertaken within the past year.

EATON — *Population*, 514.

BOARD OF HEALTH. — Frank M. Hatch, Smith C. Allard, James O. Dearing, *Selectmen.*

The water-supply is principally from wells; the village of Snowville is wholly furnished from springs in the hills near the village, the water being carried in pipes at the expense of each individual owner. There are no sewers, and but few cesspools in town.

As a whole, Eaton is hilly and well drained. The one slaughter-house in town has appeared to be all right, and no nuisance; there are no offensive trades in town.

But few of the schoolhouses have any special construction relative to ventilation; they are small, with from ten to twenty scholars to each house, and what ventilation there is, besides cracks and doors, is by means of windows; a house built last year has other means of ventilation. There are no new public buildings other than this, and the doors of all in existence swing inward.

No health regulations have been adopted by the town; the board of health has made no inspections, nor have any complaints been received by that board. No monthly report is made to the State Board of Health, and, except for an occasional isolated case, there have been no contagious diseases in the town for years.

No sanitary improvements have been made during the past year, and the only needs of the town are in regard to the wells,

which may be in some cases nearer to a privy or hog-pen than the safety would permit, but no sickness is known to have arisen from such proximity.

EFFINGHAM — *Population*, 720.

BOARD OF HEALTH. — J. M. Leavitt, M. D.

The water-supply of the town is from wells, and is considered pure; there are no sewers. The cellars of some of the houses are wet, but numerous brooks aid in draining the town, which includes four villages and one sparsely settled district. There is no nuisance connected with slaughter-houses, nor are there any offensive trades in town.

The schoolhouses are old, but are well heated, lighted, and ventilated. Doors and windows constitute the fire-escapes of hotels and public halls, but the doors of most of the public buildings swing outward.

The town has never adopted any health regulations; if an unsanitary condition is noticed by the board of health, suggestions for amendment are made, and usually followed. No monthly reports of contagious diseases are made to the State Board of Health, but great pains is taken by the local board to prevent the spread of the disease; no public funerals are allowed in deaths from contagious diseases, and disinfection is performed as a duty.

No sanitary improvements have been undertaken within the past year; the board of health endeavors to prevent the accumulation of filth, and its main work is in connection with water-closets, sink-spouts, and wells; the people have learned to care for these very well, and most of them understand the relation that filth bears to disease.

ELLSWORTH — *Population*, 947.

BOARD OF HEALTH. — James M. Dustin, Samuel Sherburn, Oscar F. Blake, *Selectmen.*

The water-supply of the town is from wells and springs; there are no sewers. There are no slaughter-houses or offensive trades in town; the schoolhouses are well heated, lighted, and venti-

lated, but the doors swing inward; they are the only public buildings.

The town has no health regulations; the board of health makes no report to the State Board of Health, and there have been no contagious diseases in town for a long time. No sanitary improvements have been undertaken within a year, and the population is so scattered that the sanitary needs are few.

ENFIELD — *Population*, 1,439.

BOARD OF HEALTH. — Denison Currier, *Selectman*.

The water-supply of the town is almost entirely from three different springs, furnished by private companies, and carried through distribution pipes. The water is considered of good quality, never known to be discolored or bad at any season of the year; the supply is ample, but is not as soft as lake water.

Some houses are furnished with good sewers, but there is no complete system. The town is naturally very well drained; the water-level is sufficiently low for dry cellars, and there are no low lands or swamps near the village.

There is a slaughter-house, under which hogs are kept, within fifty rods of dwelling-houses; complaint of this was made to the State Board of Health, and through that organization the local board was notified, but no direct complaint has ever been made to the local board.

The schoolhouses are all well heated, lighted, and ventilated; the hotels and public halls are very fairly protected against fire for a country village.

No health regulations have been adopted by the town; the board of health makes occasional inspections. Monthy reports of existing contagious diseases have been made to the State Board of Health, prompt notification of which diseases is given by the attending physicians. No deaths from such causes have occurred since March. Infected houses have not been placarded, but disinfection has been required.

Within the past year, several hundred feet of sewer pipe has been laid for drainage. The town is in good sanitary condition, except in the case of the slaughter-house mentioned above, which has been in use for several years. No new dwellings have been erected in its vicinity during the time.

EPPING — *Population*, 1,721.

BOARD OF HEALTH. — G. O. Reynolds, C. M. Woods, B. F. Hills, *Selectmen*.

The water-supply of the town is mostly from wells, of which the quality varies greatly; some are much impregnated with iron. There is a partial system of sewerage in the village; only a very small proportion of the dwellings depend upon cesspools for sink drainage, but the few cesspools are well cemented.

The village is fairly drained, but cannot always have dry cellars in times of freshets, as the river from Pawtuckaway pond flows through the village, and there are two or three swampy places, but not large in extent.

The only slaughter-house in town is two miles or more from the village, and has never been complained of, as there are only one or two neighbors and the owner throws in dry earth frequently.

The schoolhouses are in very fair condition in regard to heating, lighting, and ventilation; a schoolhouse was constructed about six years ago, and especial attention was given to these points. The hotels are but two stories in height, and have no fire-escapes; one church and one schoolhouse, built within six or eight years, have doors swinging outward.

No health regulations have been adopted by the town, and the board of health acts generally on complaint, but makes occasional inspections.

The physicians notify the board of health of existing contagious diseases, and a monthly return is made to the State Board of Health. No public funeral is allowed in cases of diphtheria or scarlet fever, and the physicians generally superintend the disinfection of the houses in which the cases occur, advising the family, and the instructions are generally heeded.

No particular sanitary improvement has been undertaken during the past year, although a little better drainage is needed in two or three localities.

EPSOM — *Population*, 815.

BOARD OF HEALTH. — H. O. Wells, *Selectman.*

The water-supply of the town is very largely from wells; there is no system of sewerage. The town is drained as well as the average country town with natural drainage. There are no slaughter-houses that constitute a nuisance, and, when necessary, regulations concerning them are enforced; no other offensive trades in town.

The schoolhouses are well heated, lighted, and ventilated, these requirements being particularly observed in the erection of recent buildings. The hotels and public halls are well supplied with fire-escapes, and the doors of the new public buildings are constructed to swing outward.

The town has adopted no health regulations, and the board of health acts only upon complaint. No monthly report of contagious diseases is made to the State Board of Health, although the physicians notify the board of the existence of such cases, as a rule. No especial attention is paid to the isolation or disinfection of such cases of disease.

No sanitary improvements have been undertaken during the past year, and the town needs nothing more than the average country town.

ERROL — *Population*, 178.

BOARD OF HEALTH. — L. C. Bragg, R. B. Thurston, E. D. Thurston, *Selectmen.*

The town is supplied with water from wells and aqueducts. There is no village, and no system of sewerage; there is very little swampy land in town, and most of the cellars are dry. There are no slaughter-houses or offensive trades in town. The schoolhouses are well lighted, but not very well heated or ventilated; no public buildings have fire-escapes.

The town has no established health regulations, and no sanitary inspections are made; there have been no contagious diseases in town for several years.

No sanitary improvements have been made during the past year, and as the dwellings are not in a village there are no particular needs at present.

EXETER — *Population*, 4,284.

HEALTH OFFICER — John H. Brown.

About one half of the town of Exeter has a water-supply from distribution pipes, furnished by the Exeter Water-Works Company, and the remainder from wells. The water of the public supply is of very bad quality from June to December; it is of a yellowish color, at times worse than others, and it has been questioned whether some substance is not introduced to bleach it. It contains no iron, is fairly soft, and is swamp water about half filtered; at the point from which it is taken, the bottom is a deep black mud; the whole source of supply covers about twenty-three acres, which was never properly cleaned out, and contains all the natural vegetable growth of a swamp, only about four acres near the dam having been dredged at all. The residents suffer greatly from the execrable condition of the water-supply, and it is an outrage to the partakers and the town in general.

There is a complete system of sewers extending over about half the town, laid out by a practical engineer, with sewers properly flushed, and nearly all on the line are connected. The health officer caused over one hundred tenements to have sewer connections during the last year. From one half to two thirds of the dwelling-houses depend upon cesspools, or some way other than sewers, for sink drainage; some of these cesspools are properly built of brick and cement, but most of them are barrels sunk into the ground, while some families have no receptacle at all, allowing the drainage to soak into the soil about the house.

The town is very well drained, most of the cellars being dry; there is no low or swamp land of any extent near the village.

There is no nuisance in connection with the slaughter-houses nor has there been for two years; the regulations of the town concerning these buildings are very strict, and have been rigidly enforced. There are no other offensive trades in town.

The schoolhouses are well heated, lighted, and ventilated, and there are sufficient fire-escapes in all hotels and public halls.

The town has adopted and issued health regulations. The physicians generally notify the board of health promptly of any prevailing contagious diseases, and when any such exist they are reported to the State Board of Health. The infected houses have

never been placarded, but proper measures are taken to insure isolation of all possible sources of contagion; public funerals are forbidden in cases of death from diphtheria and scarlet fever, and disinfection is always required.

No particular sanitary improvement has been undertaken during the past year, but the crying need of the town is purer and better drinking-water.

FARMINGTON — *Population*, 3,064.

BOARD OF HEALTH. — Samuel Y. Davis, Charles H. Berry, John H. Hersey.

The water-supply of the town is furnished by the precinct, through distribution pipes; the water is of good quality, slightly discolored at times; the fountain-head is pure, and the water is never bad at the pumping-station, but the reservoir is not always clean; the water is soft, of fair quantity, and contains traces of iron.

The sewerage system is very incomplete; there are very few sewers, and those are not flushed; ninety per cent of the dwellings depend upon cesspools, very few of which are cemented, for sink drainage.

The town is poorly drained, the water-level being too high to insure dry cellars; there is a swamp, and also a stagnant pool, both near the center of the village, the latter being impure and unhealthful in the superlative degree.

There are no slaughter-houses that constitute a nuisance, and the regulations regarding the same are enforced. No other offensive trades are carried on in the town.

The schoolhouses are well heated, lighted, and ventilated, and in the construction of new ones especial attention has been paid to these points. There are not sufficient fire-escapes in connection with the public buildings.

The town has adopted and issued health regulations, and the board of health makes occasional inspections. No monthly report of contagious diseases is made to the State Board of Health, and there have been no such cases in the town. No sanitary improvements worthy of mention have been inaugurated during the past year, although the wants of the town in this direction are numerous, as may be inferred from the above report.

FITZWILLIAM — *Population*, 1,122.

HEALTH OFFICER. — O. H. Hubbard, M. D. (Appointed.)

The water-supply of this village is obtained principally from a series of springs situated upon high land north of the village, and brought to the houses through private distribution pipes. The town supplies a public watering-place and has two large tanks for fire purposes. The water is of excellent quality, never discolored, and good throughout the year; it is soft, and free from iron and other impurities. Few villages are provided with as abundant supply of water of such undoubted purity.

A few houses upon one side of the main street are connected with a sewer for the disposal of sink drainage, but there is no complete system. Most of the houses have a plank or tile drain which discharges this drainage upon the surface of the ground or into a cesspool. Only two or three of these cesspools are cemented, the remainder having open sides and bottom.

The drainage for surface water is good, but the water-level is not low enough to secure dry cellars except to a few houses, although water does not stand in many of these even in a wet time. There are no swamps or low lands very near the village.

There are no slaughter-houses that are used sufficiently to make them a nuisance; a creamery discharged its buttermilk upon the surface of the ground in such a way that it became offensive, but this was promptly remedied.

Schoolhouses and public buildings are well heated and lighted, but not properly ventilated. There are no fire-escapes in the hotels or public halls other than doors and windows, but the doors in all the newly constructed buildings swing outward, as required.

No health regulations have ever been adopted. Sanitary inspections of schoolhouses and public halls are made, but beyond this the board of health generally acts only upon complaint. No monthly reports of the contagious diseases have been made to the State Board of Health, but all such cases have been promptly returned by the physicians. Infected houses are placarded, and in cases of death from diphtheria and scarlet fever public funerals are prohibited; thorough disinfection is required after such diseases.

The only sanitary improvements made during the year have been in securing better drainage to a number of dwellings. The sanitary needs of the town are: 1. A better disposal of sewage of all kinds; 2. A better system of ventilation in public buildings, especially in schoolhouses.

FRANCONIA — *Population*, 594.

BOARD OF HEALTH. — J. A. Morris, H. W. Priest.

The water-supply of the town is from wells, springs, and a supply owned by a private company who furnish twenty-four families. The water from this latter source is uniformly good throughout the year, is not discolored, contains iron, is soft and ample in quantity; from its fountain-head, could not possibly be contaminated.

There is no public system of sewerage; the sewers that are in use empty into the river, but the majority of the residents depend upon uncemented cesspools for sink drainage. The town is naturally well drained, the cellars being dry except in time of spring or fall freshets. There are no swampy lands in immediate vicinity of the village. There is not a slaughter-house in the village or near enough to prove a nuisance.

Schoolhouses of recent construction are well heated, lighted, and ventilated, especial consideration being given to these points. All the larger hotels are provided with fire-escapes or ladders.

It is customary for the board of health to make occasional inspections. There has not been a case of diphtheria in town since 1879, and none of scarlet fever until lately; in these instances, the house was placarded and the neighbors notified; disinfection will be required.

The town needs a more complete system of sewerage and of water-supply; the abandonment of the use of well-water is also urged.

FRANKLIN — *Population*, 4,085.

BOARD OF HEALTH. — Asa J. Thurston, Amos S. Ripley, Edrick S. Avery, *Selectmen.*

The water-supply of the town is partly from wells and partly furnished by a private company; the water is supposed to be

pure. A public supply is now under discussion. There is a fairly good system of sewers, although it is not complete; about one half of the houses are connected with it. The sewers are not properly flushed, but cesspools are generally cemented.

The town is well drained in most sections, the water-level being low enough to secure dry cellars, and there being no swamp land of any extent near the village. Regulations concerning slaughter-houses are enforced when necessary but there are none in the compact part of the town.

The schoolhouses are well heated, lighted, and ventilated; there are no fire-escapes in connection with hotels and public halls.

The town has adopted and issued health regulations, and the board of health occasionally makes sanitary inspections, also acting upon complaint. No report of contagious diseases has been made to the State Board of Health, as the residents have been very free of such diseases; the physicians have notified in nearly every case. Should placard infected houses if necessary, prohibit public funerals, and require disinfection.

One thousand feet of sewer pipe has been laid during the past year, but a complete system is greatly needed and the pipe now laid should be thoroughly flushed; a better water-supply for dwellings is also required.

FREEDOM — *Population*, 630.

BOARD OF HEALTH. — Orren E. Drake, Alonzo Pease, Nathaniel Downs, *Selectmen.*

The greater part of the town takes its water-supply from wells; quality good. There are no swamps or low lands within one half mile of the village; the cellars of the dwellings are well drained. There are no slaughter-houses or offensive trades in the town.

Some of the schoolhouses are well ventilated, but others are lacking in this respect. There are sufficient fire-escapes in our public building; three flights of stairs afford exit, the front doors swinging inward and the back door outward.

The board of health acts only upon complaints received; the physicians promptly notify the local board of the existence of contagious diseases, but no monthly return is made to the State Board of Health. Infected houses are not placarded, but public

funerals are forbidden in cases of deaths from diphtheria and scarlet fever, and the houses in which these diseases have occurred are disinfected.

No sanitary improvements have been inaugurated in the town during the past year.

FREMONT — *Population*, 726.

BOARD OF HEALTH. — Alden F. Sanborn, Harrison B. Ellis, John M. Fitts, *Selectmen.*

The water-supply of the town is for the most part from wells, and is generally of good quality. The village is not large enough to demand a system of sewers; it is well drained, with no swamps near. There are no slaughter-houses or offensive trades in town. The schoolhouses are well heated, lighted, and ventilated.

The physicians notify the board of health promptly of any contagious diseases in existence, and whenever such report is made, a monthly return is sent to the State Board of Health. Disinfection of the houses in which these cases occur is ordered by the local board. No particular sanitary advancement has been made during the past year, and as the houses are scattered through the town, the only need is individual care and vigilance of premises.

GILFORD — *Population*, 3,585.

HEALTH OFFICER. — Jonathan C. French.

The water-supply of Lake Village is chiefly from Long Bay, and is furnished by the Lake Village & Laconia Water Association; the water is brought through cement-lined pipes laid at the bottom of the bay, and is of good quality, the source being of undoubted purity; it is never discolored, unless by the conveying pipes, when it will run clear in a few minutes; is good throughout the year, soft, contains some iron, and is ample in quantity. The shores of the bay are kept as free as possible from filth and decaying matter.

There is no complete system of sewerage, there being only a few sewers in the town, and these owned by individuals. Nearly all the residents depend upon cesspools for sink drainage; part of these are bricked up, some are planked, others are stoned around the sides, but the majority have open bottoms.

The town is well drained as regards surface water; the water-level is low enough to secure dry cellars, except in a few localities, where there are springs with insufficient drainage; there are no low lands or swamps of any extent near the village. There are no slaughter-houses or offensive trades in town, but regulations concerning the same would be enforced, if necessary.

The schoolhouses are well heated, lighted, and ventilated, especial care being taken to secure these conditions in newly constructed houses. The mills of the village are well supplied with fire-escapes, and the doors of all the public buildings of recent erection swing outward.

Sanitary regulations have been adopted and issued by the town, and the board makes occasional inspections, as well as acting promptly on complaints received. No complaints have ever been received from residents outside of the village. There have been no cases of contagious diseases in town since March 1, 1890, and no monthly reports have been made to the State Board of Health since that date. The physicians notify the local board of the existence of such diseases, infected houses are placarded, disinfection is required where diphtheria or scarlet fever has prevailed, and public funerals are prohibited when deaths occur from those causes.

During the past year, a more thorough cleaning of the privies and outbuildings has been inaugurated. The principal sanitary need of the town is a complete system of sewerage for Lake Village; since the introduction of the public water-supply more water is used, with more to dispose of, and but very few of the cesspools are large enough to hold this extra surplus. As the village grows in population, more attention should be given to the care of privies; there are only a few water-closets in the village, nor can they be used to any extent until a public system of sewerage is introduced.

GILMANTON — *Population*, 1,211.

BOARD OF HEALTH. — John W. Ham, Albert R. Page, Charles E. Merrill, *Selectmen*.

The water-supply of the town is from private wells; no public supply is contemplated at present. There are no public sewers. The town is as well drained as the average; there are no swamps

or low lands near the village but what are drained. The town contains no slaughter-houses that constitute a nuisance, nor any offensive trades.

The schoolhouses are supposed to be well heated, lighted, and ventilated; the hotels and public halls are not of sufficient size to require the use of fire-escapes, and as there are none of recent construction, the doors swing inward.

No health regulations have been adopted by the town, and the board of health acts only upon complaint. The board makes no monthly report to the State Board of Health of the contagious diseases in the town; the physicians promptly notify the local board of any such cases, the infected houses are placarded, public funerals are prohibited in cases of deaths from diphtheria and scarlet fever, and disinfection of the houses containing such diseases is ordered.

No sanitary improvements have been undertaken during the past year.

GILSUM — *Population*, 643.

BOARD OF HEALTH. — I. A. Loveland, M. D., William A. Wilder, Charles W. Bingham, *Secretary*.

The water-supply of Gilsum Village is from a well directly at the foot of a sand and gravel swell at the north end of the village; on the top of this rise of ground is a burying-ground, about thirty feet from the well, with a public highway passing between. On the other side of the well is a swamp twenty feet wide, and beyond that a house, shed, barn, and hog-pen, with the usual drainage, just above the top of the well, which is on a level with the swamp. The main street is about one hundred rods distant, and the water is conducted to the Center by inch lead pipes to a large iron tank, which accommodates man and beast, while a reservoir directly underneath, with a capacity of about 400 barrels, is for use in case of fire. The supply is furnished by the town, and its purity is doubted on account of the conditions mentioned; the quantity is also insufficient, and a more ample supply is under discussion. There are several private wells in town, located in cellars, with surroundings far from the best possible; especially one supplying the village schools with drinking-water; in this

case, the barn cellar has no drain, and receives the privy deposits and melting snows in the spring. The house, shed, and barn adjoin, and the sink-drain empties into a cesspool with open sides and bottom.

There is no system of sewerage. There are two small brooks running parallel to the principal street, one on each side, in the rear of the buildings; drainage is made into or toward these, there being two or three sink and privy tile-drains that empty directly into them, rendering them filthy and unwholesome beyond endurance. There are no cemented cesspools, but occasionally one stoned like a well, and covered, until filled with slime and filth. The greater part of the sewerage in this village is "open work."

The town is naturally well drained; water-level is low enough to keep most of the cellars dry. There is low ground at the southeast part of the village, where the Ashuelot river runs near, but with proper care and small expense this would admit of good drainage. At present, there are no slaughter-houses in town that constitute a nuisance.

The schoolhouses are all very well heated, lighted, and ventilated, the only unsanitary condition being the water-supply. Doors and windows are the only fire-escapes in the hotels and public halls, and the doors of even new public buildings swing inward.

The town has adopted no health regulations; the secretary of the board of health occasionally looks over the sanitary condition of the town, and makes suggestions, but the board acts jointly only on complaints received. Monthly reports of the existence of contagious diseases have been made to the State Board of Health, but the physicians are apt to overlook notifying the local board in mild cases of such diseases. Houses have been placarded in two or three instances. The board has not been overstrenuous in regard to public funerals when deaths have occurred from diphtheria and scarlet fever, but due caution has been exercised, and disinfection has been required in cases of sickness from these diseases.

The town needs a public system of sewers, one line the entire length of the village, and one to accommodate Marlow and Short

streets, running nearly to the upper factory; the two mains would require nearly 200 rods of pipe.

GOFFSTOWN — *Population*, 1,981.

BOARD OF HEALTH. — Frank Blaisdell, M. D., C. F. George, M. D., Samuel Upton.

The town is for the greater part supplied with water from wells; occasionally the residents are furnished from springs connected with the dwellings by lead pipes. A public water-supply is now under discussion. There are no sewers; the sink drainage empties upon the surface of the ground or into barn cellars.

The town is, as a rule, well drained, and generally the water-level is low enough to keep the cellars dry; the village is on a sandy plain, with no swamps in the immediate vicinity.

There are two slaughter-houses in town, one of which is at times offensive; the regulations concerning these buildings are not enforced; no other offensive trade in town.

The schoolhouses at the Center and West villages are in good condition as to heat, light, and ventilation, but those in the outlying districts are such as prevail in rural towns. Probably especial attention would be given to these points in erecting new buildings. There are sufficient fire-escapes connected with the hotels and public halls.

The town has adopted no health regulations; the board of health acts only on complaint. The physicians promptly notify the local board of all contagious diseases prevailing in the town, which are reported monthly to the State Board of Health. Houses in which these diseases occur are placarded and disinfected in cases of diphtheria or scarlet fever; public funerals are prohibited when deaths result from these causes.

The sanitary needs of the town are a good water-supply, and a system of sewerage for the village.

GORHAM — *Population*, 1,710.

BOARD OF HEALTH. — Robert I. Heath, Nathan D. Hyde, M. D.

The water-supply of the village is from a public supply owned by a stock company, and from wells and springs. With a few exceptions, the water in these private supplies may be considered

very good. The public supply furnishes 240 dwellings, and is taken from springs one and a quarter miles distant from and 130 feet above the village; it is regarded as the best of water, never discolored, and of good quality throughout the year, and is ample in quantity.

There is only one sewer in town, the Grand Trunk sewer, running from the Alpine House to the Androscoggin river, a distance of 125 rods. About one half of the village depend upon cesspools, with open sides and bottoms, for sink drainage, and the other half empty this filth upon the surface of the ground.

The natural drainage of the town is first-class; with a very few exceptions, the cellars of the buildings are as dry as the attics, and these few are wet only in times of freshets. There is very little low or swampy land near the village.

There are two slaughter-houses in town, and they are in no way offensive; one is one mile and the other two miles from the village, and neither within one hundred rods of a dwelling or within thirty rods of a highway.

The town contains four schoolhouses, three of which are considered as well heated, lighted, and ventilated, especial attention having been given to these points in those recently built or remodeled; the other schoolhouse has good heat and light, but depends upon doors and windows for ventilation. There are no fire-escapes connected with any hotel or public hall in the town, and not one of the public buildings, except the village schoolhouse, has doors swinging outward.

Health regulations have been adopted and issued by the town; the board of health makes occasional inspections, and always acts promptly upon all complaints.

No monthly report of contagious diseases has been made to the State Board of Health, but the local board is promptly notified of their existence by the physicians. All infected houses are placarded, public funerals are forbidden where death is caused by a contagious disease, and disinfection is not only required but enforced in all such cases. From the middle of March to the first of July, 1890, between thirty and forty cases of diphtheria occurred in the town; the disease was of light form, only two cases proving fatal; it was impossible to trace the origin of the

epidemic, which was confined to no locality, selecting its victims throughout the village, among the cleanest families, as well as on filthy premises.

Within the past year, the hog-pens at the Alpine House stables have been removed and the grounds graded, which is a great improvement upon their former condition.

The principal need of the village is a system of sewers, but it seems to be impossible, for the town is poor and the taxes high, and an estimate made of the expense of such a system fixed the amount at from fifty to sixty thousand dollars. Some of the people will keep clean and wholesome without sewers, and others would persist in filth with the most perfect system in the world.

GOSHEN — *Population*, 384.

BOARD OF HEALTH. — F. P. Jones, M. D.

The water-supply of the town is from wells and springs; it is of good quality, except in the spring, when surface water runs into many of them, discoloring the water and rendering it unfit for drinking purposes; the spring water is soft, but the well-water hard; doubtless the latter often contains some iron. Most of the houses have cellar drains; there are no sewers or cesspools. The greater part of the town is well drained, but the water-level is so high that in Mill Village, during a wet season, nearly all the cellars contain more or less water. There are no low lands or swamps near the village. There are no nuisances in connection with slaughter-houses.

Each schoolhouse has a ventilator in the ceiling, but two of the buildings are unfit for use, as the wind blows through cracks in the floor and walls. The doors of these buildings, and of the town hall, all swing inward.

The town has no established health regulations, and the board of health acts only upon complaints received. Monthly reports concerning the existence of contagious diseases are made to the State Board of Health; no such cases have been attended by a physician other than the board of health; if the case should require, the house would be placarded and a public funeral prohibited; disinfection is required in cases of diphtheria and scarlet fever.

Better care should be taken of pig-pens and privies ; a free use of dry earth would be a great improvement. Sink drainage should be carried further away from the dwellings, for at present it must be a frequent source of pollution to water in wells; in many instances it is emptied just outside of the building upon the surface of the ground, and some wells must receive more or less filtered sink-water.

GRAFTON — *Population*, 787.

BOARD OF HEALTH. — Joseph B. Page, James F. Wentworth, Daniel B. Smith, *Selectmen.*

The water used in this town is mostly from wells ; it is of good quality, both hard and soft ; no public supply contemplated. There are no sewers in the town, most of the dwellings caring for only the sink drainage. The town is naturally well drained, with no swamps or low lands near the village, and the water-level is low enough to secure dry cellars. There are no slaughter-houses that constitute a nuisance, nor any offensive trades in town.

Schoolhouses are well lighted and ventilated, with one or two exceptions ; only one has been built within the past ten years and that is well constructed in these particulars. The public buildings are furnished with sufficient fire-escapes ; there are no public buildings of recent construction.

The town has not adopted any health regulations and the board of health acts only upon complaint. The board does not make monthly reports of contagious diseases to the State Board of Health, although promptly notified of such diseases by the physicians ; infected houses are placarded and disinfection of them required.

No sanitary improvements have been made in the town during the past year, and none are needed at present.

GRANTHAM — *Population*, 424.

BOARD OF HEALTH. — Rufus Hall, *Selectman.*

The water-supply of the town is from wells and springs ; there is no system of sewers and but very few drains in town. The cellars of the dwellings are generally dry, and there are no swamps or low lands very near the village. The town contains no

slaughter-houses that constitute a nuisance, nor any offensive trades.

The schoolhouses, as a general rule, are well heated, lighted, and ventilated; there are no fire-escapes in connection with the hotels and public halls.

The town has never adopted any health regulations, nor has the board of health made any report to the State Board of Health of contagious diseases prevalent in the town; in only one case of death from diphtheria has a public funeral been forbidden; families look after the disinfection of their own premises.

There have been no sanitary improvements in the town during the past year and the board of health has none to suggest.

GREENFIELD — *Population*, 607.

BOARD OF HEALTH. — John Fletcher, N. F. Cheever, M. D., George Russell.

The water-supply of the town is chiefly from wells; there are no sewers. The town has good natural drainage, the cellars being dry as a general rule; there is some swampy land near the village, but it is well drained. There are no slaughter-houses that are offensive in the town, hence the regulations concerning them have no especial enforcement; no other offensive trades in town.

The schoolhouses are poorly heated, lighted, and ventilated, and there are no fire-escapes in connection with the public buildings and halls.

The town has no established health regulations and the board of health acts only on complaints. The local board does not make a monthly report of the existing contagious diseases, although such cases are promptly returned by the physicians. The infected houses are not placarded, but disinfection is required in cases of scarlet fever and diphtheria, and when deaths occur from these diseases public funerals are forbidden.

No sanitary improvements have been inaugurated within the past year, although the town needs a better water-supply and a system of drainage.

GREENLAND — *Population*, 647.

HEALTH OFFICER. — J. W. Odell, M. D.

The water-supply of the town is from wells and springs. There are no sewers in the town. The natural drainage is good, the water-level being low enough generally to allow dry cellars; there are no low lands or swamps within a mile of the village. The town has no nuisances in connection with slaughter-houses.

The schoolhouses are fairly well heated, lighted, and ventilated, no new ones having been erected for several years, nor any kind of public buildings. It is supposed that the fire-escapes in connection with the hotels and other public buildings are sufficient.

The town has never adopted health regulations and the board of health acts only on complaint. The physicians promptly notify the board of any contagious diseases, and when any such are reported a return is made to the State Board of Health. Infected houses are not placarded, but private funerals are advised and disinfection required in cases of diphtheria and scarlet fever.

No sanitary improvements during the past year, nor are any needed at the present time.

GREENVILLE — *Population*, 1,255.

BOARD OF HEALTH. — James B. Fry, Robert Brown, Jr., H. L. Kingsbury, *Selectmen*.

The water-supply of the town is from private wells, more than half of which are dry in summer; the quality is good, it is hard and never discolored; the town has voted to put in pipes for fire purposes and they are now being laid. There are no sewers in town and all the residents depend upon cesspools for sink drainage; these cesspools are being improved each year and yet there is need of still further advancement in this direction. The town is on a side-hill and is excellently drained. There is no nuisance in connection with slaughter-houses.

No new schoolhouses have been built for some time; there are sufficient fire-escapes in the hotels and public halls.

The town has adopted and issued health regulations; no contagious diseases have prevailed here for years.

The board of health pays careful attention to the condition of cesspools and vaults and keeps them wholesome and healthful; during this summer, the Columbian Manufacturing Company have placed brick vaults and ventilators in all their water-closets, and are now laying a sewer to carry their offal into the river above the town.

GROTON — *Population*, 464.

BOARD OF HEALTH. — Sylvester Wheet, John E. Muzzy, H. J. Jesseman, *Selectmen*.

The water-supply of the town is from wells and springs; there are no public sewers. The town is naturally well drained; the water-level is low enough to secure dry cellars, and there are no low lands or swamps near the village. There are no slaughter-houses that prove a nuisance, nor any offensive trades.

The schoolhouses are well heated, lighted, and ventilated; the doors of the church and of the town hall swing inward; there are no new public buildings.

No health regulations have been adopted by the town, and the board of health acts only upon complaint. The physicians promptly notify the board of the existence of any contagious diseases, but no monthly return is made to the State Board of Health; infected houses are placarded, public funerals prohibited in cases of deaths from diphtheria and scarlet fever, and disinfection of the houses in which these diseases occur is required by the local board.

No sanitary improvements have been made within the past year. Groton is a very healthful town, and unusually free from contagious diseases.

HAMPSTEAD — *Population*, 860.

BOARD OF HEALTH. — George R. Bennette, M. D., William A. Emerson, Moses C. Morse.

The water-supply of the town is from wells and cisterns. There are no public sewers, and most houses have surface drainage for their sinks. As a whole the town is well drained; along the main street the ground is wet, but there is opportunity for drainage. There are two large lakes near the village.

There are two slaughter-houses in the town which have been complained of, but on being notified the nuisance was abated.

The schoolhouses are all well heated, lighted, and ventilated with the exception of those in districts No. 5 and No. 7, which have been built many years and need improvement. The rooms of those public buildings erected recently have doors to swing inward.

The board of health acts only upon complaint; regulations concerning contagious diseases would be observed should occasion require it.

Hampstead is one of the most healthful towns in the State, and with ordinary care in building and drainage everything necessary in the sanitary line would be secured.

HAMPTON — *Population*, 1,330.

BOARD OF HEALTH. — William E. Lane, Joseph B. Brown, Charles M. Batchelder, *Selectmen.*

The water-supply is from wells, and is considered of very good quality; there is no regular system of sewers, but the proprietors of the hotels and boarding-houses have taken especial pains to construct sewers to take their sewage quite a distance into well-cemented cesspools.

There are swamps near the village and the land is so low in the most thickly populated portion of the town, that many cellers have water in them in the spring; probably one fourth of those thus troubled are drained, so that the water does not remain long. There are no slaughter-houses that constitute a nuisance.

The schoolhouses are quite modern and will compare favorably with any in the State in respect to heat, light, and ventilation; there are sufficient fire-escapes in connection with the hotels and public halls.

The town has not adopted any sanitary regulations, and no inspections are made by the board of health unless complaint is made. The physicians are quite prompt in notifying the local board of the existence of contagious diseases, and due precaution is always taken to prevent the spread of the same.

No sanitary improvements have been undertaken within the past year, and as the board of health has had no occasion to

make a careful inspection of the town, they are not aware of any especial sanitary needs. It is hoped that one or more health officers will be chosen at the next annual town meeting, thus relieving the selectmen, and providing more time and attention for sanitary matters.

HANCOCK — *Population*, 637.

BOARD OF HEALTH. — Charles G. Mathews, John P. Hills, Henry W. Ware, *Selectmen.*

The water-supply of the village is from wells on a hill above, brought to the dwelling-houses through lead pipes; is considered pure water. There is no system of sewerage; nearly all of the houses depend upon cesspools with open sides for their sink drainage, and as the soil about the village is sandy loam, it leaches readily. The village is situated on an elevated sandy plain, and the water-level is sufficiently low to secure dry cellars. There is no slaughter-house in the town.

The heating, lighting, and ventilation of the schoolhouses are considered to be very good, and the doors of the public buildings swing outward.

The town has no established regulations in sanitary matters, and the board of health acts only upon complaint. The physicians promptly report any contagious disease existing in town, and a monthly report of the same is made to the State Board of Health. Due care is exercised in such diseases; infected houses are placarded, public funerals prohibited when death occurs from diphtheria and scarlet fever, and premises on which these diseases have prevailed are ordered disinfected.

HANOVER — *Population*, 1,817.

BOARD OF HEALTH. — William T. Smith, M. D., Prof. Robert Fletcher, H. L. Carter.

HEALTH OFFICERS. — Commissioners of Precinct, *ex officio.*

The water-supply of Hanover is brought in lead pipes from springs on a hill-top two miles from the village. Thorough chemical analysis and forty years' experience have shown that the water is not polluted by lead; it is rather soft, and always clear and pure; the supply is ample for necessity, but not for luxury, as sprinkling streets and watering lawns.

There are about 175 dwellings in the village; about twenty-five of these in the southeastern portion are connected with sewers; there are about fifty cesspools in use, most of them leaching and not cemented. The water-supply is not sufficient to allow very free flushing of the sewers and that is the reason that so few have been laid. A new line of pipe three thousand feet long has just been laid in the north part of the village which will be entered by twenty-five or thirty houses, most of which are now provided with cesspools. Many of the houses not supplied by either of the above ways are small dwellings on the outskirts of the village; perhaps a dozen of them have pipes over thirty feet long for discharging their sink drainage, the others empty it on the surface of the land. An approximate statement of the sewerage of the town would be, — connected with sewers, 25; with cesspools, 50; emptying on the surface of the land, at greater or less distance from the house, 100. Sewers will soon be substituted for more than half of the cesspools now in use.

The greater portion of the village is well drained, although in certain localities where the soil is clay the cellars are wet; there are no swamps near. One slaughter-house in one corner of the village has been offensive to a few neighbors; regulations concerning it have been repeatedly enforced to the extent of obliging the proprietor to throw in dry earth and to keep it in a clean and healthful condition.

The schoolhouses are in a fair condition as to heating, lighting, and ventilation, but the authorities are now considering these points. There are no fire-escapes on the hotels and public halls, there being but few where such precautions are needed; doors of newly constructed buildings do not all open outward.

In such a small village, there is rarely occasion for enforcing regulations in sanitary matters; the commissioners of the precinct act as health officers, leaving but few duties for the town board of health. No monthly report is made to the State Board of Health by the local board, from lack of material to report. No death from diphtheria or scarlet fever has occurred in the village for five years; in such cases, no funeral, either public or private, is advised.

The town needs a more abundant water-supply, that the sewers may be properly flushed, and a complete system of sewers should

be secured. Years ago there was a swamp on the eastern border of the village. At that time typhoid fever was much more prevalent than now and this southeastern part of the village was greatly afflicted with it ; since the construction of a sewer there eight years ago, there has been no epidemic of the fever, only an occasional case.

HARRISVILLE — *Population*, 748.

BOARD OF HEALTH. — Aaron Smith, Samuel D. Bemis, Thomas H. White, *Selectmen.*

The greater part of the dwellings in Harrisville village are owned by the Cheshire Mills Company, who furnish their tenants with an abundant supply of good water from an aqueduct fed by springs. There is no system of sewers, and no complaints have yet arisen from their lack. There is but little swamp land near the village, and the cellars of the buildings are dry, with the exception of one or two of the factories when the flash-boards are placed on the dam of the factory pond.

There is no slaughter-house in the village. The schoolhouses are very well heated, lighted, and ventilated, and there appear to be sufficient fire-escapes connected with the hotels and public halls.

The board of health has had to deal with but one case of contagious disease, diphtheria, which was reported to the State Board of Health ; the case was not fatal, but the house in which it existed was placarded and the drain ordered to be disinfected and repaired, which was done.

HART'S LOCATION — *Population*, 187.

BOARD OF HEALTH. — *Selectmen.*

Report made by J. E. Mitchell, Town Clerk.

There are no public and but very few private buildings in town, there being only four or five householders. The town has about twelve voters, most of them millmen residing in the place but a short time. The water-supply is good. The selectmen act in the capacity of health officers in case of complaint.

HAVERHILL — *Population*, 2,545.

BOARD OF HEALTH. — H. P. Watson, M. D., *Chairman*, Charles E. Newcomb, M. D., *Secretary*. (Appointed.)

The village derives its principal water-supply from springs upon the side of an adjacent mountain. It is of good quality and soft, but of insufficient quantity; no complaint has ever been made concerning its purity or healthfulness. A few deep wells are still in use.

The west side of Main street is well supplied with sewers, each house having its individual sewer, well trapped and fairly well flushed, discharging upon the side of a hill from fifty to one thousand feet below the level of the dwellings. The balance of the village depend upon cesspools, or empty their sink drainage upon the surface of the ground; a few of these cesspools are well cemented, but are generally of plank, with open bottoms, no ventilation, and the connecting pipes without traps.

The natural drainage of the town is of the best, only a few houses on one street being troubled with wet cellars in the early spring. There are no swamps near the village. The regulations for slaughter-houses are strictly enforced, and these buildings are one mile or more from the village.

The academy building is well heated and lighted, but with no system of ventilation. In the construction of new schoolhouses, no attention whatever has been given to ventilation.

There are not suitable fire-escapes in connection with the hotels and public halls, nor do the doors of even those buildings of recent construction swing outward.

The town is governed in sanitary matters by the general regulations of the State Board of Health, the local board making occasional inspections, and always acting promptly on complaint. Monthly reports of existing contagious diseases are made to the State Board of Health, but the physicians are often negligent in notifying the board of their prevalence. Infected houses are always placarded, public funerals forbidden in cases of deaths from diphtheria and scarlet fever, and disinfection required when these diseases occur.

No sanitary improvements have been undertaken for some time, although the town certainly needs an adequate water-supply

and a system of sewerage; an expenditure of thirty or forty thousand dollars would make Haverhill the sanitarium of New Hampshire.

HEBRON — *Population*, 245.

BOARD OF HEALTH. — John P. Sanborn, *Chairman of Selectmen.*

The water-supply of Hebron is soft and of good quality; there is no public supply. We have no system of sewerage; the town is well drained, with no swamp or low lands lying near the village, and the water-level is low enough to secure dry cellars. There is no nuisance connected with slaughter-houses. The school-houses are well heated, lighted, and ventilated, but there are no fire-escapes in the hotels or public halls.

The town has never adopted any health regulations, and no inspections are made by the board of health. There have been no cases of contagious diseases in the town, and no improvements in the sanitary line have been made within the past year.

HENNIKER — *Population*, 1,385.

HEALTH OFFICER. — George W. Sanborn, M. D.

A private company supplies about fifty families in the town with spring water, never discolored, of good quality throughout the year, believed to be free from iron, neither hard nor soft, and abundant in quantity during the five years it has been in use. The source is of undoubted purity, situated about one mile from the village, from which the water is conveyed to the dwellings by galvanized iron pipes, with about 230 feet fall. Very many families are supplied, independently of this company, with spring water, which is considered of excellent quality.

There is no complete system of sewers, only a few houses being furnished with them. This season the hotel has, at great expense, laid one to convey sewage from water-closets and bath-rooms. Both the sewers in the town are for the purpose of discharging the surface water after heavy rains, and have but little fall. Most of the dwellings depend upon cesspools or deep holes for sink drainage, the greater portion of which have open sides and bottom.

The town is very well drained, and with a few exceptions in the spring, the cellars of the buildings are dry; there is no low or swamp land near the village. There has been some trouble in years past in regard to slaughter-houses, but they have been cleaned immediately, and there has been no complaint lately. No other offensive trades in town.

The schoolhouses are in good sanitary condition; no new ones have been built for the past three or four years. Hotels and public halls are provided with proper fire-escapes, and in the new town hall the doors swing outward.

The town has adopted the regulations of the State Board of Health; the local board makes inspections as far as possible, and acts upon all complaints received. Monthly reports of contagious diseases are made to the State Board of Health, prompt notification of which diseases is received from the physicians. Placards are placed on infected houses, public funerals prohibited in deaths from diphtheria and scarlet fever, and the premises on which these diseases have occurred are ordered disinfected.

The new sewer at the hotel is the only sanitary progress made in the town within the past year; a complete system of sewers is very desirable. Doubtless many cases of typhoid fever, diphtheria, and "throat troubles" have their origin in badly constructed sink-drains, and if some inexpensive method of discharging that sewage could be devised, it would surely be adopted in many localities where the facilities for drainage are poor, owing to level land.

HILL — *Population*, 548.

BOARD OF HEALTH. — William C. Kelley, John Emerton, *Selectmen.*

The water-supply of the town is from distribution pipes owned by a private company, the water being of good quality. There is no system of sewerage, the residents depending largely upon cesspools for sink drainage. The natural situation of the town is such as to insure good drainage and dry cellars, with very little swamp land near the village. There is no slaughter-house or offensive trade in town. The schoolhouses are poorly constructed, from a sanitary standpoint. The board of health acts only upon complaints received.

HILLSBOROUGH — *Population*, 2,120.

BOARD OF HEALTH. — Brooks K. Webber, John Goodell, M. D., Marcellus H. Felt, M. D. (Appointed.)

The town is chiefly supplied with water by distribution pipes furnished by a private company; it is taken from a pond four miles from the village and at a high elevation; it is supposed to be pure, though usually has a slight discoloration, of the same quality all the year, soft, and abundant in quantity. But few wells are now used in the town.

There is no complete system of sewerage in the town; the hotels and three or four private houses have individual sewers. Nearly all the dwellings depend upon poorly constructed cesspools for sink drainage, — if a hole in the ground can be called such, — while the remainder allow the sewage to flow upon the surface of the ground or into the gutter.

Hillsborough Bridge village is well situated for perfect drainage, the cellars are usually dry, and there are low lands near only a small portion of the village. There is no nuisance connected with slaughter-houses, and it has never been necessary to enforce regulations concerning them. No offensive trades in town.

The schoolhouses are well heated and lighted, but poorly ventilated, although attention to these points is supposed to be given in constructing new ones. There are no fire-escapes whatever in connection with the hotels and public halls, but the doors of one or two schoolhouses built recently are hung to swing outward.

The town has not adopted any health regulations; occasional inspections are made by the board of health, and monthly reports of contagious diseases are made to the State Board of Health if any such prevail; the physicians are prompt to notify the local board of any such cases, the infected houses are placarded, disinfection is insisted upon in cases of diphtheria or scarlet fever, and public funerals are prohibited when deaths occur from these two causes.

During the past year, the board of health has caused the removal of filth, and effected a better disposition of sink-water, although from lack of a system of sewerage, not much could be accomplished in this direction. The Bridge village needs a thor-

ough system of sewerage; the question has been agitated, a survey and estimates have been made, and public meetings held to discuss the subject; but at the legal meeting, called by the precinct officers to adopt the system, the proposition was voted down, although the friends of cleanliness and progress live in hopes of a better day.

HINSDALE — *Population*, 2,258.

HEALTH OFFICER. — Arad Gilbert.

In the town of Hinsdale nine tenths of the families are supplied with water from springs north and south of the village; it is good water generally, and abundant in quantity; the remainder of the town is furnished from wells, of good quality.

There is a town system of sewers on most of the streets, which is entered by the greater part of the sink-drains, not more than one house in ten depending upon cesspools. The town is naturally well drained, the water-level is sufficiently low to allow dry cellars, and there are no swamps or low lands near the village; the Ashuelot river runs through the village from east to west, and the land north and south of it rises considerably, giving good slope to the land and securing proper drainage.

There is no slaughter-house, tannery, or other offensive trade near the village. The schoolhouses and other public buildings are well ventilated; the hotels and halls are provided with suitable fire-escapes, and the doors of newly constructed public buildings swing outward.

The town has not adopted any special regulations in sanitary matters; the board of health makes occasional inspections, and acts upon any complaint received, or when any nuisance comes to its notice. Monthly reports of contagious diseases have not been made to the State Board of Health, as there has been very little to report; physicians promptly notify the local board when cases of such diseases occur, precautions are taken to prevent the spread of the disease, and disinfection of the premises required.

No sanitary improvements of any account have been made within the past year; the town seems to be in quite a good sanitary condition, and the board of health intends to work faithfully to keep it so.

HOLLIS — *Population*, 1,000.

BOARD OF HEALTH. — David N. Hayden, H. A. Goodwin, George N. Wilson, *Selectmen*.

The water-supply of the town is chiefly from wells, most of which contain very good water throughout the year; never discolored, with no iron, and hard; ample supply. There are no sewers; a very small proportion of the houses depend upon cesspools for sink drainage, and those are uncemented.

The town is naturally well drained, the village being situated on high ground, with no low lands, except near small brooks; cellars are dry. There are no slaughter-houses or offensive trades in the town.

Schoolhouses are well heated, lighted, and ventilated, and these points have been especially considered in the construction of new ones. There are no fire-escapes in town, but the doors of newly erected public buildings swing outward.

The town has no established regulations, but the board of health makes occasional inspections. Monthly reports concerning the existence of contagious diseases are made to the State Board of Health, but there have been none of these diseases since the present local board has been in office. No sanitary improvements of any note have been made lately, and the town has no especial needs in that direction at the present time.

HOOKSETT — *Population*, 1,893.

BOARD OF HEALTH. — Elroy J. Robie, Henry C. Carbee, Moses R. Burbank, *Selectmen*.

The town is supplied chiefly with well-water; quality, varying; about twenty-five families are furnished from distribution pipes owned by a private company. This water is of undoubted purity, never discolored, soft, and abundant in quantity. There are no sewers or cesspools in the town. The town is not well drained, although the water-level is low enough to secure dry cellars, and there are no low lands or swamps near the village. There is no nuisance connected with slaughter-houses, the regulations governing them being enforced. No other offensive trades in town.

The schoolhouses are in good sanitary condition, and especial

attention has been given to heating, lighting, and ventilation in the construction of new buildings in the last year; doors constitute the only escape from fire in the hotels and public halls; doors of the buildings built recently swing outward.

No health regulations have been adopted by the town, and the board of health acts only upon complaint. Monthly reports of contagious diseases are made to the State Board of Health, although the physicians are negligent in notifying the local board of their prevalence; no precautions in such diseases have been taken, such as placarding or disinfecting infected houses, or forbidding public funerals.

No sanitary improvements have been undertaken within the the past year, but the needs of the village in this line are many, chiefly in the way of sewerage. Especially are sewers required in the most compact part of the village for sink drainage, and on the corporation where all the vaults are of wood and above the ground. A system will have to be provided eventually, and if it could be secured now, it would add very much to the health and comfort of the village.

HOPKINTON — *Population*, 1,817.

BOARD OF HEALTH. — William F. Dodge, John H. Sargent, Charles French, *Selectmen.*

Hopkinton village is supplied with water from distribution pipes owned by the Aqueduct Association; other parts of the town are supplied by wells and springs. The water is of the best quality, never discolored, and good throughout the year; as a rule, it is soft, is sufficient in quantity, and the source of the aqueduct water is of undoubted purity. There is no system of sewerage, and the greater portion of the dwellings depend upon cesspools for sink drainage; most of these have open bottoms.

The town is naturally well drained, the water-level is low enough to insure dry cellars, and there are no low lands or swamps near the village. There is no nuisance in connection with slaughter-houses, and regulations governing them would be enforced should occasion demand.

The schoolhouses are well heated, lighted, and ventilated, especial attention being given to these points when new buildings

are erected. The hotels and public halls are provided with sufficient fire-escapes, and the doors of those public buildings of recent erection are constructed to swing outward.

The board of health acts only on complaint; no monthly reports upon contagious diseases are made to the State Board of Health, although prompt notification of such diseases is received from the physicians. No placards are placed upon infected houses, neither are public funerals forbidden when deaths occur from diphtheria and scarlet fever, but in cases of those diseases, proper precautions have been taken by the owners of the infected premises, and the physicians always direct disinfection.

No sanitary improvements have been inaugurated within the past year; the town has plenty of pure air and pure water, is generally tidy and clean, with nothing objectionable or unwholesome.

HUDSON — *Population*, 1,092.

BOARD OF HEALTH. — Daniel Gage, David Clement, John M. Thompson, *Selectmen.*

The water-supply is from wells and springs. The town is not well drained, there being a small mill-pond near a collection of dwelling-houses, about which complaint has been made as the cause of several cases of typhoid fever. There is no nuisance in connection with slaughter-houses. The schoolhouses are well heated, lighted, and ventilated, and in those recently constructed especial attention has been given to these points. There are no new public buildings, but the doors of all we have swing inward.

The town has no established health regulations, and the board of health acts only on complaint. The physicians neglect to report cases of contagious diseases, and no monthly return is made to the State Board of Health; never have placarded infected houses, nor is disinfection in cases of diphtheria and scarlet fever required by the board of health, but it is generally done by the family.

There have been no sanitary improvements in town during the past year; possibly something should be done in connection with the mill-pond, about which complaint has been received.

JACKSON — *Population*, 579.

BOARD OF HEALTH. — C. E. Gale, J. B. Hurlin, F. H. Wilson, *Selectmen.*

The water-supply of the town is from wells and springs; the residents depend chiefly upon cesspools for sink drainage, the hotel discharging its sewage into the brooks. The town, as a whole, is very well drained, the village being situated upon a hill. There is no nuisance in connection with slaughter-houses; the schoolhouses are in good condition regarding heat, light, and ventilation; there are no public halls in the town, and the hotels are provided with sufficient fire-escapes.

The board of health acts only upon complaint; no deaths from contagious diseases have occurred, but the physicians promptly notify the local board of illness from any such cause.

Good health prevails in town at the present time; nearly every one tries to keep his own premises clean and healthful, and there are but few that need censure in this direction.

JAFFREY — *Population*, 1,469.

BOARD OF HEALTH. — George A. Underwood, Fred J. Lawrence, Russell H. Kittredge, *Selectmen.*

The water-supply is from wells and distribution pipes, furnished by individual owners; in quality it is very good, seldom discolored, hard or soft according to location, and, in some instances, contains iron. There is no system of drainage, each householder attending to the matter of drainage on his own premises. Jaffrey is well drained; nearly all of the cellars of the dwellings are dry, and there are no swamps or low lands near the village. There is no slaughter-house that constitutes a nuisance in the vicinity of the village, and no other offensive trades in town.

The schoolhouses and public buildings are well heated, lighted, and ventilated, and in those constructed recently especial attention has been given to these points, and doors are also hung to swing outward.

The town has not adopted health regulations, and the board of health acts only upon complaint. The local board makes monthly

reports of contagious diseases when any such are returned by the physicians; houses would be placarded and disinfection required in cases of small-pox and scarlet fever; public funerals are not prohibited in deaths from diphtheria and scarlet fever.

No particular sanitary improvements have been made during the past year, and none are needed at the present time.

JEFFERSON — *Population*, 1,062.

BOARD OF HEALTH. — C. H. Burnham, M. D.

The water-supply of the town is from mountain springs, brought by aqueducts to the different houses by individual owners. It is soft water, never discolored, supposed to be pure, and uniform in quality throughout the year.

There is a small sewerage system in the village in connection with the hotels, sufficient for all waste water, water-closet, and sink drainage; the kitchen and table waste is carried away every day to swine one mile from main road. There are no cesspools nor any vaults, except in small houses, where they are cleaned daily in the summer months.

The town is well drained, with the water-level low enough for the cellars to be dry, and with no low lands or swamps near the village.

The regulations regarding slaughter-houses are not enforced, and those in town have always been a nuisance; no other offensive trades in town.

The schoolhouses and public buildings are well heated, lighted, and ventilated, but the doors of those built recently do not open outward. Hotels and public halls have no fire-escapes whatever.

The town has not adopted any sanitary regulations; inspections are made occasionally by the board of health.

The physicians are prompt to return all cases of contagious diseases, and monthly reports are made to the State Board of Health; infected houses are not placarded, but public funerals are prohibited in deaths from diphtheria and scarlet fever, and houses in which the cases occur are disinfected. In the past fifteen years there have been but three mild cases of scarlet fever, and one case of diphtheria.

The sewers in connection with the hotels were laid within the

past year, but, further than that, no sanitary progress has been made in the town.

KEENE —*Population*, 7,446.

BOARD OF HEALTH.— Don H. Woodward, H. K. Faulkner, M. D., George W. Flagg, *Selectmen*.

The water-supply of the city of Keene is from two sources: from a pond containing about fifty-two acres, situated about two and one half miles north of the city, and also from a much larger pond in Roxbury, about five miles east of the city. It is furnished by the city and conducted in iron pipes; the water from the second pond is considered the better, is soft, never discolored, regarded as pure, and abundant in quantity.

The city has a complete system of sewerage, the Waring system, which operates exceedingly well, the sewers being properly flushed. There are some back streets into which they have not yet been extended, but new connections are continually being made, not only voluntarily but also under pressure of the board of health. The water-level is low enough to keep most of the cellars dry, but in very wet weather they contain water on some streets.

There is no slaughter-house that constitutes a nuisance; complaint has been made for several years concerning a glue factory about a mile from Central square; the matter was carried before the grand jury, but no bill was found, and so the complainants and the board of health dropped the matter. As the grand jury did not find a nuisance to exist, the board of health thought they would not be justified in finding one.

The schoolhouses are well heated, lighted, and ventilated, especial attention having been given to these points. All public buildings and schoolhouses more than one and one half stories high have fire-escapes and the doors swing outward; hotels are not thus provided.

The board of health has issued no health regulations but enforces the laws of the State and the city ordinances; the board acts on complaints, but more frequently on its own inspection. Monthly reports upon contagious diseases are made to the State Board of Health; physicians promptly notify the local board when

any such disease exists and due precautions are taken to prevent its spread. Infected houses are placarded, public funerals forbidden in deaths from diphtheria and scarlet fever, and houses in which these diseases occur are disinfected.

The whole number of complaints against nuisances made to the board from January 1 to December 1, 1889, was eighty-eight; for the previous year, seventy-three. This enumeration does not include some trivial matters of complaint. All these cases were examined, written notices have been served in most of them by some member of the board, and afterwards examined so far as to see if the written orders have been complied with. With the exception of a comparatively few, all these nuisances have been abated, very many by connecting sinks and water-closets with the public sewer.

The most serious work of the board was in connection with the epidemic of diphtheria. The cases reported were as follows:*

January	0
February	0
March	0
April	3
May	7
June	0
August	0
September	25
October (two cases of scarlet fever not included)	48
November	27
December 5 (date of report)	2
Whole number of cases reported	112

DEATHS FROM DIPHTHERIA.

April	1
May	1
September	3
October	12
November	3
Total	20

* From annual report of the Board.

PERCENTAGE OF DEATHS TO NUMBER OF CASES.

September	12
October	25
November	11 1-9
Average	17 6-7

There is another view worthy of consideration as showing that the disease was mostly confined to streets not having a public sewer, or where tenements were not connected with the public sewer. For this purpose select the month of October, when the disease was the most extensive. (The months of September and November will show like results.) The location of the disease for the month of October is as follows, viz. :

	NO. OF CASES.
North street, no sewer	2
Sullivan street, no sewer	6
George street, no sewer	2
Elm street, upper end, no sewer	5
West street, west of bridge, no sewer	3
Washington street, upper end, no sewer	1
Armory street, no sewer	3
Baker street, no sewer	1
Old Surry road, no sewer (two cases of scarlet fever)	3
Church street, sewer, but not then connected	5
North Lincoln street, no sewer	1
Madison street, no sewer	1
Water street, no sewer at this place	2
Court street, sewer, but privy not then connected; in bad condition	1
Beaver street, sewer, but privy not connected	2
Douglass street, no sewer at this place; not connected	4
Number of cases where premises were not connected	42
Mechanic street, sewer, connected	1
Lincoln street, sewer, recently connected by request of the board; nuisance not fully abated when disease began in the family, the cases being all in one family	7
	8
	50

The above table is not designed to show how many families were afflicted, for in some families there were two and even more

cases; but it does show that for a month in which the disease was at its greatest height and most malignant in form, the percentage of deaths to the number of cases being one in four, or twenty-five per cent, the disease visited only one house actually connected with and protected by the public sewer.

This showing silences the argument sometimes made against the sanitary necessity of connecting water-closets and sinks with the sewer, and disproves the claim sometimes made that the sewer gas in dwellings connected is more detrimental to health than the original condition. It also strongly shows that when the necessary precautions are taken to prevent the spread of the disease, those whose dwellings are properly connected with the sewer in wholesome surroundings can live in almost absolute safety even in a time as bad as the month of October.

With the exception of the numerous connections with the sewer, no special sanitary improvements were inaugurated in the city, and this work needs to be continued in the future as well as the abolishing of pig-sties.

KENSINGTON — *Population*, 547.

BOARD OF HEALTH. — L. S. Sanborn, James W. W. Brown, Amos M. Evans, *Selectmen*.

The water-supply of the town is from wells and springs; there is no village, and the only nuisance in the town is a soap factory, which is almost intolerable to the one family living near it. The principal complaint is of an open cesspool, where is thrown the refuse of the factory and other putrid matter, including dead hens, hogs that died a natural death, all lying in the sun and exhaling a most abominable odor, as do the chimneys over the kettles, being of insufficient height. The board of health has requested the proprietor of this nuisance to conduct his business in a sanitary manner, but without avail.

There are no established health regulations in the town; no monthly report of contagious diseases is made to the State Board of Health; no sanitary improvements have been made during the past year, and if the soap factory was managed properly, the town would be in a good sanitary condition.

KINGSTON — *Population*, 1,120.

BOARD OF HEALTH. — Charles B. Clark, Samuel Gilman, John F. Bartlett, *Selectmen*.

Report made by T. C. Reynolds, M. D.

The water-supply of the town is from wells; is hard and is impure in summer from chlorine and albuminoid ammonia. There are no sewers and but few cesspools. The town is well drained except in spring, when the flat lands in the center of the village are flooded; southeast of the village are many acres of swamp land.

There is a slaughter-house near the seminary which is very offensive the greater part of the time in the summer and which should be removed at once.

The schoolhouses are well heated, lighted, and ventilated; the doors of public buildings swing outward, but the hotels and public halls are not provided with fire-escapes.

The town has adopted no health regulations; the board of health makes no report concerning contagious diseases to the State Board of Health, and does nothing to disinfect or in any way prevent the spread of those diseases, although the physicians comply with the law in notifying them of the existence of any contagious diseases.

There have been no sanitary improvements in the town during the past year; as in many others, the people live much as they did before public sanitation commenced its work, and a general awakening to its duties and its benefits is needed.

LACONIA — *Population*, 6,143.

HEALTH OFFICER. — James L. Dixon.

The water-supply of the town is partly from wells and partly from a public supply owned by a stock company, and brought to the village through distribution pipes; the water is taken from Lake Winnipesaukee, a source of undoubted purity, and the pumping-station is one and one half miles north of the village, where the water is forced into a reservoir 215 feet above the level of the business street of Laconia. It is an abundant supply, of good quality at all times, never discolored, contains no iron, and is soft.

We have a very limited sewerage system. Not more than fifteen per cent of the dwellings depend upon cesspools for sink drainage; these are made of wood, open at the bottom, or of stone, when sides and bottom are open. The natural drainage of the town is very poor; in some localities it is almost impossible to provide for the drainage. There are low lands near the village, and the water-level is too high in some parts of the town to secure dry cellars.

There is no nuisance connected with slaughter-houses, and no complaint concerning them has ever been received. There is a small establishment, about one mile from the center of the village, for trying tallow, that has never received a permit from the health officer.

The schoolhouses are well heated, lighted, and ventilated, and especial attention has been given to these points in the construction of new buildings. The doors of those public buildings erected recently swing outward; but in the opinion of the chief engineer of the fire department, the fire-escapes in connection with hotels and public halls are not sufficient, and in some of the buildings in the village there should be better means of egress.

The town has adopted and issued health regulations; the health officer makes general sanitary inspections, and attends to all complaints. The physicians notify the health officer of all existing contagious diseases, and monthly reports of the same are made to the State Board of Health; proper precautions are invariably taken in such cases, infected houses are placarded, public funerals are forbidden in deaths from diphtheria and scarlet fever, and houses in which these diseases have occurred are disinfected.

Within the past year the town has laid 248 rods of tile pipe, and 70 rods of ten-inch pipe for surface and sink drainage combined; the cesspools are stone, with open sides and bottom, and water is conveyed from sinks in underground tile pipes; all pipes are trapped under the sinks to prevent the gases from escaping into the buildings. The people in general are learning the necessity of keeping premises in sanitary condition for their own protection as well as for the public welfare.

The town needs, first of all, proper drainage; second, a law that will give a lien on real estate on which a nuisance is main-

tained, similar to the law for the collection of taxes; third, an efficient health officer that will use good judgment at all times, and enforce the law, regardless of consequences. The health officer of a town of six thousand inhabitants or more should be paid a certain sum per week from the first of May to the first of November, so that he could devote his entire time to that duty. The sum should be a fair compensation for his labors during that time, and he should be paid in the same proportion for services actually rendered from the first of November to the first of May.

LANDAFF — *Population*, 499.

BOARD OF HEALTH. — John E. Hall, Moses G. Clark, L. B. Chandler, *Selectmen*.

The water-supply of the town is chiefly from springs, and is brought to the houses by logs or lead pipe. There is no village, hence no system of sewers; the farmers, as a rule, are not sufficiently careful about the disposal of their sink drainage. There are some low lands and swamps in the town, but, as a whole, it is well drained, with the water-level low enough to insure dry cellars. The town contains no slaughter-house or offensive trade.

The schoolhouses are well lighted, but not properly ventilated; whenever any new ones are built these sanitary points will receive careful attention. Schoolhouses are the only public buildings in town, and their doors swing inward.

The town has no health regulations, and the board of health acts only upon complaint. Usually monthly reports of contagious diseases are sent to the State Board of Health, and are omitted only when there are none to return. Physicians are prompt to notify the local board of any such diseases in existence; should any prevail, infected houses would be placarded, and public funerals would be prohibited in deaths from diphtheria or scarlet fever, should the public safety demand it.

There have been no sanitary improvements in the town within the past year; the water-supply, as a rule, is good and pure, but more care is needed in the construction and cleansing of privies, and the condition of sink-drains.

LANGDON — *Population*, 305.

BOARD OF HEALTH. — Alvin S. Cram, George H. Royce, Ira M. Russell, *Selectmen*.

The town is furnished with water chiefly from wells, the remainder with running water from springs. The sink drainage of the greater part of the dwellings is conducted to a safe and proper distance. There is no slaughter-house or offensive trade in town. The schoolhouses are fairly well heated, lighted, and ventilated.

Monthly reports of contagious diseases are made to the State Board of Health. The only sanitary progress made in the town during the past year was in regard to a well; the water was tested by Dr. G. H. Powers, of Acworth, and pronounced unfit for use.

LEBANON — *Population*, 3,763.

BOARD OF HEALTH. — Charles A. Downs, F. C. Churchill, Dixi A. Currie.

The town of Lebanon is furnished with water from springs, and a public supply. About seventy families use water from springs on surrounding hills, and it is of good quality, although at West Lebanon village some of these springs are too near the cemetery. At Lebanon Center village there is a public supply owned by the fire precinct; it is abundant for all needs, but only of fair quality, contains traces of iron, is remarkably soft, and has superior cleansing qualities; it is discolored by every rain, and in the spring receives the wash of the roads on the borders of the lakes and ponds which supply it, while some of its sources are undoubtedly polluted, especially from streams emptying into Mascoma lake in Enfield, although diluted by the large body of water.

A complete system of sewerage is soon to be commenced in Lebanon Center village. At present there are but few sewers, which conduct sewage from houses to nowhere in particular; many cesspools are in use, most of them being faulty in construction; from the larger proportion of dwellings the sink drainage is allowed to empty on the surface of the ground, but generally this sewage is cared for, and when it is neglected, attention is called to the matter by the board of health.

There is good opportunity for natural drainage for both villages, one into the Mascoma and the other into the Connecticut

river; along the Mascoma river at Lebanon Center there are extensive meadows, but they are all under cultivation, and there are no swamps near either village. There is no slaughter-house nearer than a mile to the village; complaint was received of one, but the board of health gave such orders that the nuisance was abated immediately.

Professedly, attention is given to ventilation in the construction of schoolhouses, but without very eminent success; in the building of the Lebanon high school, a large sum of money has been expended for this purpose. The doors of public buildings open outward, but the town hall is the only one provided with fire-escapes.

The board of health has issued sanitary regulations, which have been posted in the town, frequent inspections are made, and physicians report any unsanitary conditions which they may suspect in their practice. Monthly reports regarding contagious diseases are not always made to the State Board of Health, and some of the physicians neglect to notify the local board of the prevalence of such cases; infected houses would be placarded if such action seemed called for, but there has been no such need for years; public funerals are forbidden in deaths from diphtheria and scarlet fever, and houses in which these diseases have existed are required to be disinfected. During the past five years, there have been but two deaths from typhoid fever in town, one from diphtheria, and none from scarlet fever; since the organization of the board of health, filth diseases have steadily decreased.

The great sanitary need of the villages of this town is a system of sewerage, and it is very gratifying to know that this is to be realized to the extent of improvement in one village at least.

Lempster — *Population*, 519.

Board of Health. — J. N. Butler, M. D., Horatio L. Thompson, William C. Sabine.

Nearly one half of the residents of the town are supplied with running water from springs; it is soft, usually of good quality, and abundant. There are no sewers or cesspools; the sewage is usually conducted from the houses in pipes or spouts. The

town is well drained, as a whole; the water-level is low enough to secure dry cellars with proper care; at East Lempster there are swamps near the village. There are no offensive trades in town.

No new schoolhouses have been built lately, but those in use are well heated, lighted, and ventilated. No public buildings have been constructed in recent years.

The town has not adopted any health regulations, and there are no official inspections by the board of health at stated periods. There have been but very few cases of contagious diseases in town for the past year, and no monthly reports regarding them have been made to the State Board of Health. Disinfection is required in houses needing it. During the past year some improvements have been made respecting sink drainage.

Progress in all reforms is slow, and so it is in sanitation; but the people are now much better informed in matters pertaining to their general health than a few years since.

The medical member of the board makes an investigation whenever he considers it necessary, in connection with his professional attendance.

LISBON — *Population*, 2,060.

BOARD OF HEALTH. — G. W. Shattuck, M. D., J. F. Thompson, C. B. Jefferson.

The water-supply of Lisbon is from Mink pond, connected with the houses by distribution pipes, and furnished by a private company; it is soft, and ample in quantity; the source is undoubtedly pure, but the water often becomes discolored with mud, and is very bad after heavy rains, and some of the time in the summer.

The sewerage of the town is in a very bad condition; the board of health has labored earnestly for improvement in this direction, and a system is now contemplated, and it is hoped will be commenced this fall. There are no cesspools. The natural drainage of the town is quite good; with a few exceptions, the cellars of the houses are dry, and there are only very small swamps near the village, and these are quite well drained.

The regulations concerning slaughter-houses are enforced, and there are none that are troublesome, nor are there any other offensive trades.

The schoolhouses are all well heated, lighted, and ventilated; all the hotels and public halls are provided with fire-escapes, but the doors do not all swing outward.

Rules and regulations governing contagious diseases, sewers, offensive trades, dwelling-houses, and other sanitary matters have been adopted and issued by the town; sanitary inspections are made occasionally by the board of health, who also act upon any complaints received. No monthly reports of contagious diseases are made to the State Board of Health, and the physicians are very negligent about notifying the local board of the prevalence of any such cases. Public funerals are forbidden in deaths from diphtheria or scarlet fever, and houses infected with those diseases are ordered disinfected.

Good sanitary progress has been made in the matter of sewerage, and, in a short time, the town will probably be in a healthful condition in that respect; a better water-supply is also needed, and, with some expense, could be secured.

LIVERMORE — *Population*, 155.

BOARD OF HEALTH. — *Selectmen.*

Report made by George S. Payne, Town Clerk.

The town is abundantly supplied with water from natural springs; sometimes in the spring it is a little yellowish, and is said to contain iron. There are no sewers; the town is built on a side-hill, and everything in the shape of sewage goes down the surface of the ground into Sawyer river. The natural drainage of the town is good; the water-level is low enough to secure dry cellars, but the nature of the soil is such that a cellar is an impossibility unless it is blasted out with dynamite. There is no slaughter-house or other nuisance in town. Schoolhouse is on high ground, and is well heated, lighted, and ventilated.

The board of health insists that the people all keep their premises clean, and also have various disinfectants in the house to be used in case of sickness. There is no resident physician, but those who practice here notify the board of any existing con-

tagious disease, and all precautions possible are taken against the spreading of the disease, although no monthly reports are made to the State Board of Health. There have been no sanitary improvements within the past year, and the town has no especial needs in this direction.

LONDONDERRY — *Population*, 1,220.

BOARD OF HEALTH. — George W. Miller, Charles G. Pillsbury, Charles R. Bailey, *Selectmen*.

The water-supply of Londonderry is from wells owned by individuals; there are no sewers in town. The natural drainage is good as a whole; with few exceptions the cellars of the houses are dry. There is no nuisance connected with slaughter-houses nor are there any offensive trades in town.

There are no newly constructed schoolhouses, but those in use are well lighted and ventilated and well heated by wood stoves.

There are no hotels in town, but the doors of the town hall swing outward.

The town has not adopted health regulations, and the board of health acts only on complaints received. The physicians promptly notify the local board of health of any existing cases of contagious diseases, but no monthly returns of the same are made to the State Board of Health. Public funerals are prohibited in deaths from diphtheria and scarlet fever, disinfection of the houses in which these diseases occur is required, and all infected houses are placarded.

The town has not made any sanitary improvements during the past year, nor are any especially needed at the present time.

LOUDON — *Population*, 1,000.

BOARD OF HEALTH. — Daniel S. Green, Clarence L. Clough, Caleb D. Marston, *Selectmen*.

The water-supply is from wells; it is of good quality, except from some wells in the spring, never discolored, contains no iron, is soft, and abundant in quantity. It is considered pure. There are no sewers, and about three fourths of the houses depend upon cesspools for sink drainage, these being mostly with open sides and bottom.

The village is divided by the Soucook river, rising on either side about forty-five feet, thus allowing good drainage; no low lands within half a mile of the village. There is no slaughter-house within one hundred rods of a dwelling, and regulations have never needed to be enforced. No other offensive trades in town.

The schoolhouses are in a very bad condition; they are badly lighted and ventilated, and as for heating, the stoves are always placed in one corner of the room; thus some scholars are suffering from heat while others are very cold, and all complain of cold feet. No attention to these sanitary points has been given in the construction of new buildings. The hotels and public halls are not provided with fire-escapes.

The town has no established regulations in health matters; the board of health acts only upon complaint. In cases of contagious diseases, the local board is promptly notified by the physicians; the infected house is placarded; should deaths occur from diphtheria or scarlet fever public funerals are prohibited, and houses in which cases of these diseases prevail are ordered disinfected.

There have been no sanitary improvements lately, but something should be done at once to put the schoolhouses in a more healthful condition.

LYMAN — *Population*, 543.

BOARD OF HEALTH. — William A. Gorton, Charles E. Elms, Albert S. Moulton, *Selectmen.*

The water-supply is from wells, in some instances brought to the houses by means of logs or lead pipes. There are no sewers. The natural drainage of the town is good, the water-level being low enough to allow dry cellars. There is no village, the town being wholly a farming community and the dwellings scattered. There is no nuisance in connection with slaughter-houses and no necessity of enforcing regulations concerning them; no other offensive trades in town.

The schoolhouses are well heated, lighted, and ventilated; there are no other public buildings in town.

The town has not adopted any health regulations and the board of health acts only on complaints received. Monthly reports of

contagious diseases are not made to the State Board of Health, and no such cases have existed to the knowledge of the local board. No sanitary improvements have been made within the past year and the town has no particular needs in that direction.

LYME — *Population*, 1,154.

BOARD OF HEALTH — Henry H. Holt, Benjamin T. Washburn, George S. Mayo, *Selectmen*.

The town of Lyme includes two villages, one of which is supplied with soft, pure water from wells a little way out of the village. The supply of the other village is from an aqueduct owned by a private company; this is very good water, but is inadequate in quantity. There is no public system of sewerage, but many private sewers to individual houses; the sink drainage of most of the dwellings is well cared for.

The town is, as a whole, well drained, the water-level being low enough to secure dry cellars in almost all the houses; no particular unsanitary influence from swamps or low land near the villages. There is only one slaughter-house of any account in town, and this one has been kept in good condition during the past summer.

The schoolhouses are well heated and lighted, and generally quite well ventilated; there are but few hotels and public halls in town, and no new public buildings have been erected for many years.

No health regulations have been adopted, and the board acts only upon complaints. No monthly reports of contagious diseases have been made to the State Board of Health and no such cases have been reported to the local board for the past year. The town has made no sanitary improvement for some time.

LYNDEBOROUGH — *Population*, 657.

BOARD OF HEALTH. — J. A. Woodward, *Selectman*.

Lyndeborough is a farming town with no compactly settled village. The water-supply is generally good; the sink-drains on the farms are usually in a bad condition; some are underground, and others are spouts above the ground conducting the drainage but a short distance from the house, and the drains in the

village are the same. There is no nuisance connected with slaughter-houses, nor are there any offensive trades in town. The schoolhouses are not heated, lighted, or ventilated by the best modern methods. There are no fire-escapes provided for the hotels or public halls, but the doors of a new hall swing outward.

The town has never adopted any health regulations, and no monthly report of contagious diseases is made to the State Board of Health.

MADBURY — *Population*, 367.

BOARD OF HEALTH. — Martin V. B. Felker, Charles R. Cosking, Arthur W. Simpson.

The water-supply of the town is from wells, of good quality, contains no iron, and is soft or hard according to locality. There is no complete system of sewers; those in use are for sink drainage, and are not well flushed.

The natural drainage of the town is good, although there are some low lands, but the water-level is sufficiently low to allow dry cellars. There are no slaughter-houses or offensive trades in town.

The schoolhouses are well heated, lighted, and ventilated, especial attention having been given to these points. The town hall is the only building in town that is provided with fire-escapes.

There are no established health regulations, and the board of health acts only upon complaints received. There have been no cases of contagious disease in town for five years; should any occur, infected houses would be placarded.

MADISON — *Population*, 554.

BOARD OF HEALTH. — Josiah H. Hobbs, Frank R. Bennett, Frank W. Barrett, *Selectmen*.

HEALTH OFFICER — W. G. Martin, M. D.

The water-supply of the town is principally from wells; there is no complete system of sewers. There is some low land near the village at Silver lake, and the water-level of the town is not low enough to secure dry cellars in all localities. There are no

offensive trades in the town. The schoolhouses are not well heated, lighted, or ventilated, and the fire-escapes in connection with hotels and public halls are insufficient.

No sanitary regulations have been adopted by the town; occasional inspections are made by the board of health. No monthly reports are made to the State Board of Health in regard to contagious diseases, although the physicians are prompt, as a rule, in notifying the local board of the existence of any such cases; infected houses are placarded and disinfection required in cases of diphtheria or scarlet fever, and public funerals are forbidden in deaths from these diseases. The principal sanitary needs of the town are in connection with the schoolhouses.

MANCHESTER — *Population*, 44,126.

BOARD OF HEALTH. — George C. Hoitt, M. D., William M. Parsons, M. D., Joseph B. Sawyer, C. E., *Clerk*.

Manchester is furnished with water from a public supply owned by the city. The supply is taken from Lake Massabesic, four miles distant; this lake has an area of about 2,500 acres, and drains some forty square miles of sparsely inhabited territory in the towns of Auburn, Candia, and the eastern part of Manchester. The quantity pumped for the use of the city varies from fifty-two million gallons per month to sixty-eight million in July; the supply is always abundant.

The system of sewers is not above criticism, but probably is as good as can be found in any city of a similar size and growth. In the last ten years about $256,000 has been expended in the construction and maintenance of sewers. Nearly all the buildings in the compact part of the city, including the houses fifty to one hundred feet apart, are connected, but houses are constantly being built upon newly opened and unsewered streets, and in such cases cesspools are used; these are generally arranged to allow the water to leach away into the ground.

The natural drainage of the town is good, the land is mostly sandy, there are no swamps of any extent near the city, and the water-level is low enough to secure dry cellars in nearly all localities.

There is one large slaughtering and rendering establishment, of which there has been complaint, but the managers have so far improved their apparatus and methods of work that it is not now considered a nuisance; the board of health makes frequent inspections of the place. The board has very little occasion to make or enforce regulations in regard to offensive trades, as those who carry on such occupations have generally done well without compulsion.

Some of the older schoolhouses are deficient in respect to heating, lighting, and ventilation, but year by year these defects are being remedied. Two of the houses have recently been much improved by the introduction of the Smead closets; most of the larger houses are heated by steam, with both direct and indirect radiation; in the construction of new buildings, especial attention is given to all that appertains to sanitation. Since 1880, about $103,000 has been expended on schoolhouses, but the five largest and most costly ones were built before that time; one is now in process of erection in ward eight, the estimated cost of which is $40,000.

The mills are well supplied with fire-escapes, and the same may be said of the principal hotels; but most of the large business and tenement blocks have but the merest apology for such structures, and many of them have nothing of the kind.

We occasionally issue regulations for sanitary matters, but not as many as formerly; experience has taught that the general statutes of the State are sufficient for most of the cases with which we have to deal. Inspections are constantly being made, both with and without complaint having been entered.

Monthly reports of contagious diseases are made to the State Board of Health, and the local board is promptly notified of the existence of any such cases by the attending physicians; infected houses are placarded, private funerals required in deaths from diphtheria and scarlet fever, and houses in which these diseases have occurred are ordered disinfected.

No especial sanitary improvements have been inaugurated within the past year; we have been following out lines of work previously commenced, such as the frequent and careful cleaning of privy-vaults and barn-cellars, more care for cleanliness in

yards, cellars, and passageways, better precautions against contagious diseases, and the banishment of swine from the compact part of the city.

The city needs a competent agent or superintendent who should be paid for devoting his whole time and attention to sanitary affairs; he should have a public office where he could be found at certain hours, and the remainder of his time should be devoted to outdoor work. He should be the registrar of vital statistics; if he were a competent medical man he might be charged with the duties of city physician.

We need a better way of disposing of the rubbish and waste of the city; the swill is now carried to a place two miles from the city hall by a contractor, and fed to swine. The other rubbish and debris is collected by the highway department, and dumped into low places in projected streets. The work of the swill contractor has made no perceptible improvement in the character of these dumps; they are about as foul and ill-smelling as they were when the swill went into them. The whole mass of rubbish should be burned in a furnace constructed for that purpose.

We need a hospital for contagious diseases other than smallpox; in that disease, the value and necessity of isolation and disinfection are generally understood and insisted upon; diphtheria and scarlet fever are no less amenable to these measures, but they are measures that are entirely impracticable in the crowded tenement blocks and among the ignorant and careless. It is believed that such a hospital, properly conducted, would prove itself one of the most beneficent and indispensable of our public institutions.

We need a more enlightened and vigorous public sentiment in regard to the protection of our water-supply. The city should own or control a belt of land at least one hundred and fifty feet wide all around the lake; on this belt no buildings, either permanent or temporary, for the housing of man or beast, should be allowed.

Finally, above all things, we need the dispelling of that apathy and ignorance which tolerates filth and uncleanliness in persons and surroundings; when people can be made to see that filth, even though it may not perceptibly "stink," bears about the same relation to sickness that shavings and benzine do to a conflagration, the sanitary battle will be won.

MARLBOROUGH — *Population*, 1,695.

BOARD OF HEALTH. — Levi A. Fuller, Joel F. Mason, Ivory E. Gates, *Selectmen.*

The town is furnished with water from wells, and from distribution pipes owned by a private company; the latter furnishes an abundant supply of soft water, contains no iron, and is of good quality, never discolored or bad at any season of the year, while its source is of undoubted purity. There are no sewers in town.

The town is naturally well drained, the water-level is sufficiently low to secure dry cellars, and there are no low lands or swamps near the village. The regulations governing slaughter-houses are enforced, and there are none that constitute a nuisance, neither are there any other offensive trades in town.

The schoolhouses are well heated, lighted, and ventilated, and especial care has been exercised in this direction in the construction of new ones. The hotels and public halls are provided with sufficient fire-escapes, and the doors of public buildings erected recently swing outward.

The town has adopted and issued health regulations, but the board of health acts only on complaints received. Monthly reports of contagious diseases have not been made to the State Board of Health, but prompt notification is received from the physicians by the local board of any such diseases existing in the town; infected houses are placarded; in case of death from diphtheria or scarlet fever public funerals are forbidden, and the houses in which these diseases have occurred are disinfected. No sanitary improvements have been inaugurated within the past year, and at present the town has no particular sanitary needs.

MARLOW — *Population*, 584.

BOARD OF HEALTH. — Milan F. Jones, William S. Gray, *Selectmen.*

The water-supply of the town is from wells, of good quality, and never discolored, a little hard, but ample in quantity. There are no sewers. The natural drainage of the town is good, and the water-level is low enough to secure dry cellars. There is no

nuisance connected with slaughter-houses, nor other offensive trade. The schoolhouses are poorly heated, lighted, and ventilated, and there are no fire-escapes on the hotels or public halls.

No health regulations have been adopted by the town, and the board of health acts only upon complaint. Monthly reports on contagious diseases are made to the State Board of Health when any such exist; the physicians promptly notify the local board of any such disease prevailing in the town, and public funerals are prohibited when deaths occur from diphtheria. There have been no sanitary improvements within the past year.

MASON — *Population*, 629.

BOARD OF HEALTH. — J. O. Reed, Jr., B. F. March, E. S. Spalding, *Selectmen*.

The town is supplied with water of good quality from wells. There are no sewers. The town is well drained naturally, and has a low water-level. There are no slaughter-houses in town. The schoolhouses are all old structures, and are not properly ventilated. There are no established health regulations; no sanitary improvements have been undertaken for some time, and the village is one that needs only private individual work in the sanitary line.

MEREDITH — *Population*, 1,642.

BOARD OF HEALTH. — J. I. Prescott.

The water-supply of the town is from wells; there are no sewers. The town is naturally well drained, and there are no swamps or low lands near the village. The schoolhouses are well heated, lighted, and ventilated; the hotels and public halls are provided with sufficient fire-escapes.

The town has not adopted any health regulations, but occasional sanitary inspections are made by the board of health, and all complaints receive proper attention. The physicians notify the local board promptly of all existing diseases, but no monthly report of the same is made to the State Board of Health; infected houses are placarded, and public funerals are forbidden in deaths from diphtheria or scarlet fever.

MERRIMACK — *Population*, 951.

BOARD OF HEALTH. — William P. Melvin, *Selectman*.

The water-supply of the town is from individual wells containing all grades of water; there is no system of sewers, each house-owner providing for his own sewage. The water-level of the town is low enough so that nearly all of the cellars are dry. There are three villages, none of them very large, Reed's Ferry, Thornton's Ferry, and South Merrimack. There are no slaughter-houses or offensive trades in town. The town house is in good sanitary condition, and the doors swing outward; some of the schoolhouses are well heated, lighted, and ventilated, but others are in a poor condition in these respects, although improvements are made each year. There are no hotels in town.

The board of health acts upon complaints received; monthly reports of contagious diseases are not made to the State Board of Health, although the local board is promptly notified of any such cases by attending physicians; there has not been a case of diphtheria or scarlet fever in the town for more than a year, but any infected house is placarded. No particular sanitary progress has been made during the past year; many of the farmers need to be awakened to the fact that their drinking-water is polluted; samples from wells in the town have been tested and pronounced unfit for use. There are other unsanitary surroundings that should be changed, such as hog-pens in close proximity to dwelling-houses.

MIDDLETON — *Population*, 207.

BOARD OF HEALTH. — Benjamin P. Chesley, Daniel B. Jones, Edgar N. Stevens, *Selectmen*.

This is a farming town, with no village; the farmers live at a sufficient distance from each other for each to have a goodly share of pure atmosphere. The only offensive trade in town is liquor-selling, one common to many towns and difficult to eradicate. The schoolhouses are not of modern construction, but as the school terms are only in the spring and fall, nature assists in keeping them pure and wholesome, and in the future doubtless others will be erected. The doors of the church do not swing

outward, and proper escape in case of fire is not provided in this building.

The town has no official health regulations; the board of health attends to any unsanitary condition coming to its knowledge. There have been no cases of contagious diseases in the town.

MILAN — *Population*, 1,029.

BOARD OF HEALTH. — Ralph Cole, Charles E. Phipps, John W. Martin, *Selectmen.*

The town is furnished with water chiefly from private aqueducts and springs, but some wells are in use; the supply is ample, and the sources are pure; contains no iron, generally soft, but sometimes hard. In the spring the water is discolored and polluted by melting snows in many localities. There is no system of sewers; this is a farming town, and each individual arranges for the disposal of sewage for his own convenience, and generally there is no need of interference by the board of health.

The natural drainage of the town is good, and there are no swamps or low lands near the village; there is no slaughter-house that constitutes a nuisance, hence no regulations are enforced; no other offensive trade in town.

The schoolhouses are well heated, lighted, and ventilated, especial attention being given to these points in newly erected buildings. The hotels and public halls are provided with suitable fire-escapes.

The town has no established health regulations, and the board of health acts only upon complaints received; no monthly reports concerning contagious diseases are made to the State Board of Health, nor has the local board ever received a notification of any such case by the physicians if any has existed. Proper precautions, as placarding infected houses, forbidding public funerals, and disinfection, would be taken should such measures become necessary, but most of the people of the town pay attention to these matters without orders from the board of health. There have been no sanitary improvements in the town during the past year except such as individuals have undertaken for their own safety, and the needs at the present time require only private home labor.

MILFORD — *Population*, 3,014.

BOARD OF HEALTH. — W. H. W. Hinds, M. D., *President*, William M. Knowlton, *Treasurer*, H. S. Hutchinson, M. D., *Secretary*.

The water-supply of the town is both from wells and from a public supply; distribution pipes are laid through all the principal streets and service pipes are constantly being laid to these, so that in the near future the use of this water will be very general; a private company now owns the plant, but probably the town will purchase it before long. The quality is fair, it has a slight tinge in summer, and is a little brackish in taste, and an analysis shows this to be due to vegetable matter; it contains no iron, is quite soft, abundant in quantity, and promises to remain so.

A system of sewerage was begun last year; quite a sum of money was expended, but only a beginning was made; some buildings were connected, but at present the number is small; an arrangement for flushing the sewers is made from the newly constructed water-supply, which answers the purpose fairly. The majority of buildings depend upon other means for disposal of sink drainage; some have cesspools, but the greater portion allow the sink-water to be deposited on the surface of the ground; some of the cesspools used have sides laid with stone.

A considerable portion of the town is not very well drained. There is much stagnant water in and near the village in the form of ponds; these are artificial, however, and maintained for manufacturing purposes; except for these artificial barriers, there is no swamp or low land that would not be well drained.

Several slaughter-houses exist in the town, but the amount of discomfort and risk to health is very small indeed, as they are thoroughly supervised by the board of health; one large tannery is also in operation, but it gives but little annoyance, as a sewer conducts the waste matter to the river.

The schoolhouses are not large enough to accommodate the pupils properly, and the heat, light, and ventilation are faulty, yet there has been no noticeable injury to the health of the pupils from these defects; one new building was erected last year, in

which careful attention was given to sanitary points. The hotels and public halls are supplied with proper fire-escapes.

Health regulations have been adopted by the town, and are printed and distributed annually; the board of health makes occasional inspections and attends to all complaints received. No monthly reports on contagious diseases are made to the State Board of Health, although the local board is promptly notified of the existence of any such cases by the attending physicians; infected houses are not placarded, but public funerals are forbidden in cases of deaths from diphtheria or scarlet fever, and houses in which these diseases have occurred are ordered disinfected. The system of sewers before mentioned is the only sanitary improvement of any note within the past year. This work of better disposal of sewage and garbage should be continued, while the drainage of the town should receive more attention. Above all, do the people of the town need a thorough appreciation of the fact that health and filth are incompatibles.

MILLSFIELD — *Population*, 62.

No town organization; report made by Hattie L. Raymond, Postmistress.

The water-supply of the town is principally from wells; there are no sewers. The natural drainage of the town is good, and there is no nuisance in connection with slaughter-houses. The schoolhouses are poorly heated, lighted, and ventilated; there are no hotels or public halls. As there is no local board of health, no monthly reports of contagious diseases are made to the State Board of Health, and there have been no sanitary improvements made within the past year.

MILTON — *Population*, 1,640.

BOARD OF HEALTH. — Luther Hayes, Henry B. Scates.

The water-supply of the town is chiefly from wells, and the quality is generally good. The town, as a whole, is very defective in sewerage; there is no system of sewers, each individual owner disposing of sewage at his own convenience; nearly all of the dwellings depend upon cesspools for sink drainage, and these are not well cemented.

At Three Ponds village the natural drainage is greatly affected by the rise and fall of the pond, and the condition of wells and cellars also depends upon it in a large measure ; when the pond is high, it is impossible to keep the cellars drained in some parts of the village. There is no slaughter-house or offensive trade in the villages.

Nearly all the schoolhouses in town are poorly heated, and, in fact, are in a deplorable condition in all respects, but the town expects to build two or three new ones next year, and to repair others. There is now in process of erection at Milton Three Ponds village a fine school building, costing twenty-five thousand dollars, to be known as the Nute High School. The only fire-escapes in town are on the Burley & Usher shoe factory.

The board of health acts only upon complaint. No monthly reports concerning contagious diseases have been made to the State Board of Health, and no cases of a serious nature have existed in the town. There have been no sanitary improvements undertaken within the past year, but better sewerage is needed to conduct the sewage from sinks and cesspools to the river. The general sanitary condition of the town is good.

MONROE — *Population*, 478.

BOARD OF HEALTH. — C. B. Paddleford, *Selectman*.

The water-supply of the town is from wells and springs; there are no sewers. The town is well drained, being located chiefly on a side-hill ; the water-level is sufficiently low to secure dry cellars, and although there are low lands and swamps near the village, the village is at a higher elevation. The town contains no nuisance in connection with slaughter-houses. No fire-escapes are needed at the hotels or public halls.

The town has not adopted any health regulations, no sanitary inspections are made, nor are any complaints received by the board of health. No monthly reports of contagious diseases have been made to the State Board of Health, none have been returned by the physicians, and there have been no such cases to deal with. No sanitary improvements have been made within the past year.

MONT VERNON — *Population*, 479.

BOARD OF HEALTH. — William F. Hadley, Charles H. Raymond, W. P. Woods, *Selectmen.*

The water-supply of the town is wholly from wells; it is soft, and no complaint has ever been made concerning the quality or quantity. A public supply for the village is now under discussion. There is no complete system of sewers, and in many cases privies and sinks are not properly drained. The town is fairly well drained naturally, although there are many cellars that are wet at certain seasons of the year; there are no swamps near the village. There is no slaughter-house or offensive trade in town.

The schoolhouses are well heated, lighted, and ventilated; there are no buildings provided with improved methods of fire-escapes, and none have been erected lately.

The town has not adopted any health regulations; sanitary inspections are made on complaint, and at other times. The local board of health is promptly notified of any existing cases of contagious diseases by the attending physicians; there have been no cases of diphtheria or scarlet fever in town during the past year.

During the past year drains and pipes amounting to $500 were laid; the village needs a sewer throughout its entire length, so that sinks, privies, and cellars may be more thoroughly drained.

MOULTONBOROUGH — *Population*, 1,034.

BOARD OF HEALTH. — George H. Bragg, *Selectman.*

The water-supply of the town is chiefly from wells, when it is generally hard, and the remainder is from springs, and is soft; quality from both sources is good. The sink drainage is conveyed from nearly all the houses by gutters. The town is not well drained, although the water-level is low enough to secure dry cellars in a majority of the dwellings. There is no nuisance in connection with slaughter-houses. The schoolhouses are well heated, lighted, and ventilated. The hotels and public halls are not provided with fire-escapes.

Occasional inspections are made by the board of health, and

it also acts upon complaints received. No monthly reports of contagious diseases have been made to the State Board of Health; there have been no sanitary improvements in the town lately, and none are needed at present.

NASHUA — *Population*, 19,311.

BOARD OF HEALTH. — Willard C. Tolles, M. D., Charles S. Collins, M. D., Augustus W. Shea, M. D.

The water-supply of Nashua is from Pennichuck pond, located northwest from the city, and is furnished by a private company. The water is good at all seasons of the year; soft, pure, and abundant in quantity. There are very few wells in use.

We have sewers, but not a complete system. Most of the houses along the lines of sewers are connected therewith; the sewers are well flushed. About one half the houses have cess-pools or dry wells; the latter are for the most part open at the bottom and not cemented at the sides.

The city is well drained for the most part; the water-level is sufficiently low to allow dry cellars. There is some swamp land along Salmon brook at the southern part of the town, but not very extensive.

There is no slaughter-house that constitutes a nuisance in the city. One soap factory is a nuisance at times, but it is looked after when it becomes in any way offensive.

Our schoolhouses are well lighted, heated, and ventilated; especial attention is given to these points in the construction of new buildings. Our fire-escapes are ample, and the doors of public buildings swing outward.

The city adopts health regulations, and the board of health acts upon complaints and also inspects the worst parts of the city every two or three weeks.

We make monthly reports to the State Board of Health; our physicians report promptly in cases of contagious diseases; we placard infected houses, prohibit public funerals in deaths from diphtheria and scarlet fever, and require the disinfection of houses where these diseases have occurred.

Our sewerage system is being extended and arrangements made for flushing and connecting smaller sewers with the main lines.

Garbage is collected once a week and buried in a suitable place.

Our greatest need is a full and complete system of sewers. We also should have a health officer, who should make regular visits to all houses and places not in perfect sanitary condition, give proper directions in regard to abating nuisances, and see that they are carried out. The salary of the board of health should also be increased.

NELSON — *Population*, 332.

BOARD OF HEALTH. — Marcus M. Bailey, Charles A. Tarbox, Fred A. Scott, *Selectmen*.

The water-supply of the town is principally from wells; no public supply exists or is contemplated. There are neither sewers nor cesspools. The town appears to be well drained naturally, and the water-level is low enough to secure dry cellars; there are low lands containing ponds east and west of the village but there are no swamps. There are no slaughter-houses or offensive trades in town.

The schoolhouses and public buildings are old structures and well lighted but poorly ventilated. There are no fire-escapes in connection with hotels or public halls.

No monthly reports of contagious diseases have been made to the State Board, but the local board has always been notified promptly of any such cases by the attending physicians; the infected houses have always been placarded, public funerals are forbidden in deaths from any contagious disease, and houses in which any such disease has occurred are ordered disinfected.

No sanitary improvements have been accomplished within the last year other than the general cleaning up around premises in the spring; the dwellings of this town are few and far between, and every resident can attend to his own sanitary needs.

NEW BOSTON — *Population*, 1,067.

BOARD OF HEALTH. — Thos. E. Cochran, Chas. S. Colburn, Eugene A. Edwards, *Selectmen*.

The water-supply is mostly from wells; a small amount is distributed through pipes from wells close by. Think no change is contemplated.

A few houses have sewers which discharge into the river, but there is no complete system, considerably less than half the houses being thus sewered. The remaining dwellings have simply a wooden spout with surface drainage. The site of the town is naturally well drained, the Piscataquog river passing through the center of the village. There are no low lands or swamps near the village, and the cellars are mostly dry.

There are no slaughter-houses and no offensive trades, other than rum-selling, in town.

Our schoolhouses are well heated and lighted but not all are well ventilated. I think special attention is given to these points in the construction of new buildings.

In the two new churches, town house, and school building, the doors swing outward, as the law directs; but in Valley Hall, which is used quite largely as a public hall, perhaps twice as much as all the other halls together, the outside doors swing inward, while the inside doors swing both ways.

The town does not adopt health regulations, and the board of health acts only on complaints. Our board makes a monthly report to the State Board, and the physicians report promptly in contagious diseases; but we do not placard infected houses. There have been no public funerals in deaths from diphtheria and scarlet fever for two or three years. The disinfection of infected houses is left for the doctors to attend to.

The sanitary improvements of the year consist of the laying of sewer pipes to discharge sink drainage into the river.

There seem to be no sanitary needs at the present time. Three years ago most of the public buildings and several dwellings in the center of the village were burned. These have been rebuilt and in their construction a great deal of attention has been given to sanitary requirements.

NEWBURY — *Population*, 487.

BOARD OF HEALTH. — Hiram B. Cheney, Richard T. Muzzey, Joel Gillingham, *Selectmen.*

The town is supplied with water from wells and springs; generally good, soft water; no public supply and none contemplated. There are no public sewers. The natural drainage of the town is good; the cellars of the dwellings are generally dry,

and there are no low lands or swamps near the village detrimental to health. There is no nuisance connected with slaughter-houses.

The schoolhouses are considered well heated, lighted, and ventilated. There are no new public buildings in town, and the hotels and public halls are supposed to be well provided with fire-escapes.

There are no established health regulations, and the board of health acts only upon complaints received. No monthly reports concerning contagious diseases have been made to the State Board of Health, and there have been no such cases. There have been no sanitary improvements made within the past year, and none are needed at present.

NEW DURHAM — *Population*, 579.

BOARD OF HEALTH. — Dana P. Jones, Eben B. Berry, Ephraim K. Roberts, *Selectmen.*

The water-supply is principally from wells; generally pure.

This is a farming community, and the sewerage consists chiefly of underdrains from sink-spouts. The town is naturally very well drained; cellars are generally dry. Not much low land near the village. No slaughter-houses in town. We think the schoolhouses are generally well heated, lighted, and ventilated.

The town does not adopt health regulations, but the board of health makes occasional sanitary inspections. There have been no cases of contagious disease in town during the year. There have been no sanitary improvements of any importance in town during the year; nothing in particular is needed.

NEWINGTON — *Population*, 401.

BOARD OF HEALTH. — Thomas B. Hoyt, *Selectman.*

The town is supplied with water from wells and springs; there are no sewers. The natural drainage of the town is quite good, the water-level being low enough to secure dry cellars in most of the houses. There are no offensive trades or slaughter-houses in town. One schoolhouse was built in 1872, and is fairly well lighted and heated; no public buildings have been erected since then. There are no hotels, and the only hall is over the schoolroom, with no escape in case of fire other than the stairway.

The board of health acts only upon complaint; the physicians promptly notify the board of any prevailing contagious disease, and proper precautions are taken to prevent the spread of the disease, although no monthly reports in regard to any such cases are sent to the State Board of Health. Placards are placed on the infected houses; public funerals are prohibited in deaths from diphtheria or scarlet fever, and any houses which have contained these diseases are disinfected.

There have been no sanitary improvements in the town within the past year, and as Newington is small in area and thinly settled, the residents have but few wants in this direction.

NEW IPSWICH — *Population*, 969.

BOARD OF HEALTH. — Francis W. Prichard, Charles L. Robbins, William T. Bucknam, *Selectmen.*

The water-supply is from wells and is of good quality. Only a few private houses have sewers; in a majority of cases, the sink drainage is deposited on the surface of the ground, although quite a number of residents conduct it to a distance from their houses in pipes or troughs and a few have cemented cesspools.

The natural drainage of the town is good, with no low lands or swamps near the village, and the water-level low enough to insure dry cellars. There is no slaughter-house that constitutes a nuisance, or other offensive trade.

The schoolhouses are well heated, lighted, and ventilated, and there are very good means of escape in case of fire connected with the hotels and public halls.

The town has no established regulations in sanitary matters; occasional inspections are made by the board of health and action is also taken on all complaints received. No particular sanitary progress has been made in the town lately; a better system of caring for sink drainage is needed, and more cesspools. At times the privies connected with the Columbia Manufacturing Company have caused complaint, but they have been properly kept during the past season.

NEW LONDON — *Population*, 799.

BOARD OF HEALTH. — Charles W. Gay, Jacob H. Todd, William S. Carter, *Selectmen.*

The water-supply of the town is principally from wells, but some spring water is used. The town is situated on a hill and is well drained; there are no swamps or low lands near the villages and the water-level is low enough to secure dry cellars in most parts of the town. There are no slaughter-houses or offensive trades in town.

The schoolhouses are all well heated, lighted, and ventilated; there are no large hotels or public halls, the villages being small, hence there is no need for fire-escapes.

The town has never adopted any health regulations, and the board of health acts only upon complaints received. Monthly reports of contagious diseases are made to the State Board of Health whenever there are any such in the town; physicians are prompt to notify the local board if such diseases exist. In a very few cases of diphtheria and scarlet fever the board has ordered disinfection, but public funerals in deaths from those causes have been allowed and infected houses have never been placarded.

There have been no sanitary improvements in town within the past year, and none are needed at present.

NEWPORT — *Population*, 2,623.

BOARD OF HEALTH. — Elisha M. Kempton, Joseph W. Parmelee, Thomas B. Sanborn, *Secretary.*

The water-supply of the town is from wells on the premises or from springs, conveyed to the houses in pipes; two parties furnish water to families by the year, but the greater number of residents own wells or springs; the water is of good color, that from springs and most of the wells being soft; the supply is insufficient and a more ample one is greatly needed, and a company has already been organized and is prospecting for an abundant supply of pure, soft water sufficient for all purposes.

There is only one short sewer in town, running from North Main street to the river, and very few houses are connected with it; cesspools are the chief reliance for sink drainage, and are

made with open bottom. The village is well located for natural drainage; the surface water flows readily to the river and there are covered drains on a portion of Main street. There are no swamps near the village except one of a few square rods, and the water-level is low enough to secure dry cellars.

The slaughter-houses are outside of the village and no complaint concerning them has been received for three years; a tannery in the center of the village is the only other offensive trade in town.

The schoolhouses in the village and as far as known throughout the town are well lighted, heated, and ventilated, with a few exceptions; in remodeling those in the village, particular attention was given to lighting and ventilation, and one of the resident physicians has made a careful study of these sanitary points. The hotels are not provided with fire-escapes. The doors of the town hall open outward. One block — the Lewis block — has doors from second story opening outward, others swing inward.

The town has no local health regulations in force, and the board of health acts only upon complaint. Monthly reports on contagious diseases are made to the State Board of Health when any such prevail; the physicians promptly notify the local board of such cases. There has been no occasion to placard infected houses, but this would be done if necessary; public funerals are forbidden in deaths from diphtheria, and there have been none from scarlet fever for three years. Disinfection of houses is required and enforced in case of death from any contagious disease.

No especial sanitary improvement has been attempted within the past year; the members of the board of health, whether called by complaint or whenever the opportunity presented itself, have endeavored to enlighten the people and stimulate every one to better methods of drainage and sanitary surroundings. The town very much needs a system of sewers to drain into the river and a better water-supply is also required, but the latter want will soon be met.

NORTHFIELD — *Population*, 1,115.

BOARD OF HEALTH. — William M. Cogswell, R. N. S. Bachelder, Edwin D. Forrest, *Selectmen.*

The water-supply of the town is from Knowles pond, two miles east of the village, and is furnished by a private company. It is very good throughout the year, never discolored, soft, thought to be ample for many years to come, and its source is considered pure.

Some of the residences on the high river bank have private sewers to the river, but they are few in number and not much has been accomplished in this direction, as the water-supply has been in use only a year or two. Nearly all of the sink drainage is deposited on the surface of the ground. The natural drainage of the town is good, with but very little swamp land near the village, and the water-level is low enough to insure dry cellars.

The slaughter-house is about three fourths of a mile from the compact part of the village and is very well conducted; occasional cautions are given the owners that the best of care must be exercised in its sanitary condition if they would remain in their present location.

The schoolhouses are well heated and lighted, but no especial attention has been given to ventilation, and the only method at present is by means of windows. The Northfield side of the village (Tilton) contains but two public buildings, — the school building and town hall.

The town has not adopted health regulations and the principal work of the town board of health is attending to complaints. The physicians promptly notify the board of any contagious diseases prevailing in the town, although no monthly reports are made to the State Board of Health; public funerals are forbidden in deaths from diphtheria and scarlet fever, and the houses in which these diseases occur are disinfected. Placards would be placed on infected houses should occasion require them.

Sanitary progress in the town has been gradual, as the people have become awakened to the necessity of it; the town needs one main sewer to the river and should then require sinks and privies connected with it.

NORTH HAMPTON — *Population*, 804.

BOARD OF HEALTH. — Otis S. Brown, George W. Knowles, Cyrus Fogg, *Selectmen.*

The water-supply of the town is from wells. All of the dwellings depend upon cesspools with open sides and bottom for sink drainage; the only village in the town is the summer settlement at Little Boar's Head, and nearly all of the houses and cottages drain into the ocean; quite a number of these summer residents are in favor of laying one large sewer, and doubtless something will be done in this respect in the near future.

The town is naturally well drained, the water-level being low enough to insure dry cellars, and there are no low lands or swamps near the village. There is no nuisance in connection with slaughter-houses.

The schoolhouses are well heated, lighted, and ventilated, and especial care has been taken to secure good results in these points in the construction of new school buildings. The hotels and public halls are not properly provided with fire-escapes, but the doors of newly erected public buildings are hung to swing outward.

The town has no established health regulations and the board of health acts only upon complaints received; the local board does not make monthly reports of contagious diseases to the State Board of Health, although they receive prompt notification of any such cases from the physicians. Infected houses are placarded, houses in which diphtheria and scarlet fever have occurred are disinfected, and public funerals are forbidden in deaths from these diseases. There have been no sanitary improvements in the town during the past year.

NORTHUMBERLAND — *Population*, 1,356.

BOARD OF HEALTH. — James H. Curtis, J. W. Welch, Charles Hutchinson, *Selectmen.*

The town is chiefly supplied with running water, conveyed to the houses by wooden logs or iron pipes; some wells and pumps are still in use. The supply of Groveton village is furnished by a private company; it is generally good, clear water, soft, and of sufficient quantity for practical purposes.

There is no system of sewers to convey sewage from buildings; there are only a few sewers in town, and these are for disposing of surface water. The town is, as a whole, well drained naturally, the building lands being dry and allowing dry cellars. The butchers of the town use Western beef, kept in refrigerators, so there is not much trouble with slaughter-houses. No other offensive trades in town except liquor-selling.

The public buildings and schoolhouses are well heated, lighted, and ventilated, and in the construction of new schoolhouses due attention is given to these points. Possibly the hotels and public halls are not sufficiently provided with fire-escapes.

The town has not adopted any health regulations and the board of health makes sanitary inspections only on complaints received. No monthly reports of contagious diseases have been made to the State Board of Health, and no such cases have occurred in the town. No particular sanitary improvements have been undertaken within the past year, and at present the only need of the town in this line is a system of sewers to carry off waste water in a wet time.

NORTHWOOD — *Population*, 1,478.

BOARD OF HEALTH. — E. G. Boody, L. E. Kimball, J. J. Bartlett, *Selectmen.*

Our water-supply is mostly from wells; in some instances the water is hard, but generally soft; do not know whether the water contains iron or not. A survey has been made by parties contemplating the introduction of a public supply from Jenness pond.

There are no sewers in town, to my knowledge. Most families depend upon cesspools for the disposal of their drainage when anything beyond surface drainage is attempted. This town is naturally well drained, and the water-level is sufficiently low to insure dry cellars. There are low lands near the Narrows, but the drainage is good.

One slaughter-house in town has been a source of complaint, but upon being notified the proprietors placed it in good condition. No other offensive trades in town.

Our schoolhouses are well lighted and ventilated, and heated by stoves. There are no fire-escapes in connection with any pub-

lic building or hall in town, neither do the doors of such buildings swing outward.

Our town has never adopted health regulations, and the board of health acts upon complaints only. Our board has not made monthly reports to the State Board, so far as I know; think they have never had occasion to do so since I have been on the board. Have never known a house to be placarded in case of a contagious disease; neither have I known a public funeral to be prohibited in a death from diphtheria or scarlet fever. Do not have to require the disinfection of infected houses, because it is so generally attended to without, except in particular cases.

There have been no sanitary improvements during the year.

I think the greatest need of our town at present is that some physician be appointed to act with the board of selectmen as a board of health.

NOTTINGHAM — *Population*, 988.

BOARD OF HEALTH. — Benjamin W. Crawford, John E. Cooper, Thomas E. Fernald, *Selectmen*.

Our water-supply is from wells. We have no sewers. The town is naturally well drained. No slaughter-houses in town. Our schoolhouses are well heated and lighted, and our new schoolhouse is well ventilated.

Our town does not adopt health regulations. Have had no cases of contagious disease in town during the past year. There have been no sanitary improvements, and none are needed.

ORANGE — *Population*, 245.

BOARD OF HEALTH. — John H. French, Samuel L. Hoyt, Russell Sanborn, *Selectmen*.

The water-supply is principally from wells; the water is generally of unquestioned purity. No public supply is contemplated. We have no sewers. The natural drainage of the town is good. Have no slaughter-houses. Our schoolhouses are well ventilated; have built no new schoolhouses since the passage of the town system law.

The board of health would act upon complaints if any were received. There have been no contagious diseases in town, to

my knowledge, hence we have made no monthly report to the State Board.

ORFORD — *Population*, 916.

BOARD OF HEALTH. — Isaac Willard, *Selectman*.

The water-supply is from nine large springs (private) and two public wells. The spring water is of the best quality, never discolored or bad, contains some iron oxide, is soft and ample in quantity. The well-water is pure, contains some lime.

There is no house sewerage; there are two surface-water drains. Two thirds of the dwellings drain into stoned vaults. The town is naturally well drained, being situated on the best terrace lands in the Connecticut valley. There are no swamps near the village. No slaughter-houses in town.

Our public buildings are generally well cared for. Some of our district schoolhouses are poorly ventilated; heated with box stoves.

The board of health acts upon complaints only. We make no monthly report to the State Board of Health. Physicians report promptly; we placard infected houses, prohibit public funerals in deaths from diphtheria and scarlet fever, and require the disinfection of infected houses.

A village improvement society has been organized during the year.

OSSIPEE — *Population*, 1,630.

BOARD OF HEALTH. — Thomas Nute, Orodon P. Hobbs, *Selectmen*.

A part of the town is supplied with water from an aqueduct at Ossipee Corner, and the remainder from springs and wells.

There are no sewers or cesspools in town, except at the Pine River House, at Ossipee. Cellars in town are usually dry. There are no slaughter-houses. Our schoolhouses are heated by wood stoves. There are no fire-escapes, except at the county almshouse, and all doors to public buildings swing inward.

The town does not adopt health regulations, and the board of health acts only upon complaints. Our board does not make monthly reports to the State Board. Physicians generally notify

us promptly of any case of a contagious disease; we prohibit public funerals in deaths from diphtheria and scarlet fever, and require the disinfection of houses where such diseases have occurred.

There have been no sanitary improvements in town during the year.

PELHAM — *Population*, 791.

HEALTH OFFICER. — Amos Batchelder, M. D.

The water-supply is from individual covered wells, from which surface water is excluded. The open wells and old well-sweeps have disappeared, and more care is taken than formerly in relation to drinking-water. In some cases the water is hard, in others soft. If the water is not of good quality it is generally owing to neglect.

This is an intelligent farming community. We have no sewers, but the ordinary methods of drainage are adopted. Typhoid fever is comparatively rare in this town, and has been so for the past twenty years.

The town site is naturally well drained by Beaver river, which flows through the town from northwest to southeast. A not very low swamp of some eight or ten acres lies near the village.

Neither slaughter-house nor offensive trade in town. Our schoolhouses are mostly new and well heated, lighted, and ventilated. The doors of the two public halls swing outward.

Our town adops no health regulations; the board of health does not make occasional inspections, and there are no complaints received. Our board does not make monthly reports to the State Board of Health, and I am not aware that any precautions are taken in contagious diseases.

I do not know that there have been any sanitary improvements in the town during the past year, and none are needed at present.

PEMBROKE — *Population*, 3,172.

BOARD OF HEALTH. — Isaac G. Russ, James Dodge, Victor Guilbert, *Selectmen*.

A part of the water-supply is from springs, and a part from an aqueduct; the quality of the water is very good.

We have sewers along the main street; think about one half the houses are connected. The cesspools are well cemented. The town is well drained and the cellars are dry; there are no low lands or swamps near Suncook village. No offensive slaughter-houses or other buildings in town. We call our school-houses well heated, lighted, and ventilated. We have but one hotel in town and that is a small one; no fire-escapes.

The board of health makes occasional inspections of the village. We do not make a monthly report to the State Board of Health. Our physicians report promptly in cases of contagious diseases; we placard infected houses, prohibit public funerals in deaths from contagious diseases, and require the disinfection of houses where such diseases occur.

There have been no sanitary improvements during the past year. Think we are fairly well off as regards sanitary needs.

PETERBOROUGH — *Population*, 2,507.

BOARD OF HEALTH. — C. A. Jaquith, Jotham G. Morrill, Charles W. Hunter, *Selectmen*.

The water-supply of our village is from wells and aqueducts. The town is situated in a valley, and the neighboring hills abound with springs which furnish pure water. These springs are being utilized more and more with each succeeding year for private and neighborhood aqueducts. We have no public water-supply.

We have no complete system of sewers. The town put a sewer in the main street, and one other, last year. There has been a large decrease in the number of cesspools during the past year, owing to private enterprise.

The town is favorably situated for good drainage; cellars are usually dry; no swamps or low lands near the village. Our slaughter-house is well outside the village; no offensive trades in town.

Our public buildings are in good condition. Our shoe factory is the only public building having a fire-escape; but the doors of such buildings are made to swing outward, as the law directs.

The town does not adopt health regulations. Our doctors report to us any unsanitary conditions observed by them and we

give our immediate attention to the same, as well as to any other complaints. Our board does not make a monthly report to the State Board of Health, but our physicians are prompt to report any case of a contagious disease. We placard infected houses, prohibit public funerals in deaths from diphtheria and scarlet fever, and require the disinfection of houses where these diseases have occurred.

There have been no public sanitary improvements in town during the past year. Our greatest need is a public system of sewerage.

PIERMONT — *Population*, 709.

BOARD OF HEALTH. — H. H. Palmer, W. H. Horton, Aaron Barton, Jr., *Selectmen.*

The water-supply is mostly brought in pipes from springs, by private companies. The water is soft and never discolored. It is generally good at all seasons of the year, and is sufficient in quantity except during a very dry season; do not know that it contains iron. No public supply is contemplated.

We have no public sewers; each dwelling has its own method of caring for its sewage. The town is naturally well drained and the cellars are dry; there are no low lands or swamps near the village.

There are slaughter-houses in town, but none near the village. Our schoolhouses are well heated, lighted, and ventilated; we have no new school buildings.

The town does not adopt health regulations, neither does the board of health make inspections. Our board does not make monthly reports to the State Board of Health; the physicians do not report contagious diseases; we do not prohibit public funerals in deaths from scarlet fever and diphtheria, neither do we require the disinfection of infected houses.

There have been no sanitary improvements during the past year; do not know that any change is needed.

PITTSBURG — *Population*, 669.

BOARD OF HEALTH. — E. L. Farnham, James W. Baldwin, R. A. Tabor. (Appointed.)

The water-supply of this town is generally brought in pipes or logs from individual springs; the water is soft and of best quality the year round.

No sewers in town. There is no need of sewers in this town. Nature has attended to the drainage. Our cellars are good.

We have no regular slaughter-house in town; but beef cattle are killed occasionally in different places. No offensive trades in town.

Our schoolhouses are not what they should be; they are poorly ventilated, not properly heated, and the light is not well distributed; but worse than all else are the desks which the pupils are obliged to occupy. Our new schoolhouses are built on the same old plan. I have tried to remedy the evils, but have failed. None of our buildings have fire-escapes. The town house is the only public building having the doors swing outward.

The town does not adopt health regulations. We have taken great pains to improve the sanitary condition of the people, and I think we have made progress in many directions. Our board makes monthly reports to the State Board. We intend to placard infected houses. We have had some trouble in regard to public funerals in deaths from diphtheria and scarlet fever, but have always carried our point. Use disinfectants in all places where contagious diseases have occurred. Our physicians do not report promptly in cases of contagious diseases.

We have made some sanitary improvements during the year; have caused privies to be moved, slop-holes changed or drained, pig-pens changed, old wells filled, chip dirt taken from sheds, etc., etc.

There are many changes that would improve the sanitary condition of our town, as well as towns near by. Water is a source of much trouble in all small towns; in many instances it is brought to the dwelling, but no provision is made to conduct it away, and it is left to form mud-holes with the slops and filth of the house, and this condition is the cause of disease in many instances. New buildings are not properly located, stables, barn-

yards, hog-pen, privy, etc., being in many cases on higher land than the dwelling, and all the waste from these buildings is allowed to drain toward the house and saturate the soil about. Our dwelling-houses are poorly constructed, and there are other unsanitary conditions too numerous to mention.

The board of health in rural towns has much to contend with that in cities is better understood and appreciated. Our people are not accustomed to having their domestic affairs meddled with, and many times we have hard work to convince them that it is for their benefit that we comply with the law. But they are beginning to understand the intentions of the board of health and are more ready to comply with our instructions. We have distributed the various pamphlets sent us, and shall try to improve the condition of our town during the coming year.

PITTSFIELD — *Population*, 2,605.

BOARD OF HEALTH. — P. S. Elliott, F. W. Blake, A. H. Young, *Selectmen.*

Our water-supply is furnished through distribution pipes, by a private water company. The water is of good quality, but it is slightly discolored after a heavy rain; it contains no iron, is soft, ample in quantity, and its source is of undoubted purity.

About two thirds of the dwellings are connected with the public sewer, which is well flushed once a month. The water-level of the town is sufficiently low to secure dry cellars, and there are no swamps near the village. No slaughter-houses which constitute nuisances. Our schoolhouses are well lighted, heated, and ventilated. There are no fire-escapes in connection with any building in town, but the doors of public buildings swing outward, as the law directs.

The board of health acts upon complaints received. We make no monthly report to the State Board of Health. Our physicians are prompt to report cases of contagious diseases; infected houses are placarded, public funerals are prohibited in deaths from contagious diseases, and houses where such diseases have occurred are disinfected.

Additional sewers have been laid during the year.

PLAINFIELD — *Population*, 1,173.

BOARD OF HEALTH. — Elbridge G. Beers, M. D., Edwin K. Miller.

Our water-supply is mostly from wells, dug at points and places most convenient to the buildings, without regard to surroundings or the natural gravity of surface or under currents. The water is hard, containing little iron, but more lime; it is ample in quantity.

A water-supply is proposed for the village of Meriden in the near future. The matter is in the hands of a stock company, and the stock is partly subscribed. A spring of nearly pure water, flowing three gallons per minute, and located 155 feet above the highest point of the village, has been secured. There are other springs in the vicinity that can be obtained if necessity requires. We hope to have the water running through the pipes before the snow flies.

We have no sewers of any account, and but very few cesspools for sink drainage. The sink drainage is discharged directly upon the ground, where it can be easily seen and covered with fresh earth whenever it becomes offensive, and as occasion requires it is taken up and put upon the land as a fertilizer. The town being hilly is naturally well drained; the water-level is low enough to secure dry cellars, and as a rule there are no low lands near dwellings.

In town we have three, and occasionally four, slaughter-houses, but they are remote from dwellings and the highway, and are always kept in proper order. Our schoolhouses are well heated and lighted, and in the construction of the new ones especial attention has been given to ventilation.

The board of health has no code of ethics, issues no health regulations, and acts only upon complaints received. We have not made monthly reports to the State Board of Health, for the simple reason that we have had nothing to report, or next to nothing. The physicians are very prompt to report in any case of contagious disease and we should prohibit public funerals in any such case.

There have been no sanitary improvements in the town during the past year.

Our greatest need is more light upon the subject of filth diseases, — some printed matter explaining their causes would be of value.

PLAISTOW — *Population*, 1,085.

BOARD OF HEALTH. — F. N. Flanders, Daniel M. Peaslee, Gayton C. Greeley, *Selectmen.*

Our water-supply is from wells. We have no sewers, very few cesspools, and nearly all of them have open bottoms and sides. The town site is naturally very well drained; a few cellars have water in them in the spring, but all can be well drained. There are no very low lands or swamps near the village. No slaughter-houses or offensive trades in town. Our schoolhouses are well heated and lighted, and are ventilated by dropping windows. In the construction of our new schoolhouse, which is to be built this season, proper ventilation is provided. We have no fire-escapes in town, but I presume the doors of the new schoolhouse will be made to swing outward, as the law requires.

This town does not adopt health regulations, and the board of health acts only upon complaints received. During the past four or five years, and I think even longer than that, we have had no occasion to take any action in regard to contagious diseases.

There have been no sanitary improvements in town during the past year. I do not know that we have any sanitary needs, but I feel that I am not competent to discuss this question.

PORTSMOUTH — *Population*, 9,827.

HEALTH OFFICER. — H. F. Clark, M. D.

QUARANTINE BOARD OF HEALTH. — H. F. Clark, M. D., Walter Grey, D. W. Jones, M. D.

The general water-supply of the city is from an aqueduct, owned until recently by a private company, now purchased by the city, which will take possession January 1, 1891, and will immediately begin improvements in the service; the water is of excellent quality at all seasons of the year, never discolored, soft, and from a source of undoubted purity. The supply has been insufficient, but will soon be increased.

There is one large sewer that drains the breweries and one side of the city, discharging into the river; plans have been made and the city will soon construct a new one for the west side of the city, caring for the sewage now discharging into the south mill-pond; but there will still remain for some time a large number of cesspools, most of them merely barrels or hogsheads sunk into the ground.

As a whole the city is poorly drained; there are no low lands or swamps of any size in the immediate vicinity, but the water-level is not low enough to secure dry cellars except by a complete system of sewerage.

There are two slaughter-houses in town, one of which an attempt was made to abate several years since, but without success; there is also one soap factory on the outskirts of the city.

Two new schoolhouses have been erected during the past year which have modern improvements from a sanitary point of view, the Smead system of heating and ventilation being used; the old buildings are provided with the best of these conditions. The doors of the new public buildings are hung to swing outward, but while some of the hotels and public halls are provided with sufficient fire-escapes, others need investigation in this direction.

The city has adopted and issued sanitary regulations; as a rule the board of health acts only upon complaints received, no sanitary inspections being made as should be, as the city does not provide for such action. Monthly reports of contagious diseases are made to the State Board of Health when there are any to return; the physicians are negligent about notifying the local board when any such disease exists, but whenever serious cases are reported, the infected houses are placarded; public funerals are also prohibited in deaths from diphtheria or scarlet fever, and houses in which these diseases have occurred are ordered disinfected.

The city has shown more interest in sanitary matters lately than in former years. Some two years since, the board of health secured an indictment against the city on two schoolhouses; the result has been the erection of two fine school buildings the past year, and the discontinuance of the old ones for school purposes. Aside from these new buildings and some slight im-

provement in defective sewers, there has been no especial sanitary progress in the city within the past year; there is much work to be done in this direction, a more abundant water-supply and a complete system of sewers being greatly needed, and these will probably be secured in time, but great results in sanitary matters cannot be achieved in Portsmouth as quickly as in some younger city. This year the city board of health consists of only one member or health officer.

RANDOLPH — *Population*, 137.

BOARD OF HEALTH. — Hubbard Hunt, George F. Scates, George Wood, *Selectmen.*

The water-supply of this town is from wells and private aqueducts, there being a plentiful supply of pure, soft water from the mountain sides, and it is generally free from iron.

The farmhouses have no system of sewerage, but the public houses have. We think there are no cesspools in town. The cellars in this town are almost all dry; we have no village. No slaughter-houses or offensive trades. Our schoolhouses are well heated, lighted, and ventilated. The board of health acts upon complaints. We do not make a monthly report to the State Board of Health. Physicians notify us of contagious diseases. We prohibit public funerals in deaths from contagious diseases; but this being a country town such diseases are not frequent.

Our sanitary improvements for the year consist of private sewerage at the hotel.

We think the sanitary condition of this town is decidedly better than that of the cities and towns of the State in general; but we think the sink-spouts and privy-vaults should receive more attention.

RAYMOND — *Population*, 1,131.

HEALTH OFFICER. — True M. Gould, M. D. (Appointed.)

The water-supply is from wells. There are no sewers in town. The town is not drained artificially, but there is no standing water in the village and but very little low land. No slaughter-houses in town.

Our schoolhouses are heated by means of wood stoves. In the

construction of new school buildings, special attention is given to heating, lighting, and ventilating.

There are fire-escapes on one of the shoe factories. The new shoe factory, three stories in height, now being built, has no fire-escapes, and the doors swing inward.

The town does not adopt health regulations, and the board of health has never made sanitary inspections unless called upon. I think we have never made monthly reports to the State Board of Health. Physicians report promptly in cases of contagious diseases; we placard infected houses, prohibit public funerals in deaths from contagious diseases, and require the disinfection of houses where these diseases have occurred.

There have been no sanitary improvements in town until the present time. The selectmen, by vote of the town, are removing the bodies from the old cemetery in the village to Pine Grove cemetery, one half mile from the village. The first burials in the old cemetery were in 1799.

The town is in need of a good supply of water. A pond about one mile and a half from the village, and 75 feet higher, would afford an abundance of very pure water. There has been some talk of supplying the village with water from this pond.

RICHMOND — *Population*, 476.

BOARD OF HEALTH. — Almon Twitchell, Albert H. Martin, Stephen A. Bullock, *Selectmen.*

The water-supply of the town is obtained in about equal quantities from wells and aqueducts. The quality is usually good, but some wells have had a bad odor this summer.

The natural drainage of the place is good. No slaughter-houses or offensive trades. Our schoolhouses are well heated, lighted, and ventilated. The board of health acts upon complaints received. I think we have not made a monthly report to the State Board of Health; since last April there has been nothing to report. There has been but one case of contagious disease in town for two years, and that was a case of diphtheria, which was promptly reported.

This is a small town among the hills, and a scattered community. Each household attends to its own sanitary matters.

RINDGE — *Population*, 996.

BOARD OF HEALTH. — Henry W. Wellington, George G. Rice, *Selectmen.*

The water-supply is from public wells; the quality is generally good. We think no public supply is contemplated.

We have no complete system of sewerage, and we know of no cesspools in town. Most of the sink drainage is discharged upon the surface of the ground.

As a general thing, the natural drainage of the town is good; most of the cellars are dry, and there are no swamp lands near the village.

We have no slaughter-house that is much used, and none that constitutes a nuisance. Most of our schoolhouses are well heated, lighted, and ventilated; much more attention is given to these points than formerly.

No fire-escapes in connection with any public building in town.

Our town adopts no health regulations, and the board of health acts upon complaints only. Our board does not make a monthly report to the State Board of Health. Physicians report promptly in cases of contagious diseases; we placard infected houses, prohibit public funerals in deaths from diphtheria and scarlet fever, and require the disinfection of houses where these diseases have occurred.

There have been no sanitary improvements in town during the year.

We think some of our people should take better care of their sink drainage and privies.

ROCHESTER — *Population*, 7,396.

BOARD OF HEALTH. — F. E. Whitney, M. D., George F. Willey. (Appointed.)

Our water-supply is largely from wells. Aqueduct water has been supplied to a number of families by a private company. It would be very satisfactory to the town if a better supply of water could be furnished. A committee was appointed at our last town meeting, either to buy the present water-works, or to pro-

vide water from some other source; but they have not made the purchase yet, and do not know that they will.

We have sewers for conducting the surface water, and about seventy dwellings are connected therewith, — in all cases near the outlet. The sewers have to be flushed often, or foul odors are noticeable at the drops. Most dwellings depend upon cesspools for sink drainage. This town is not well drained. The surface is extremely level, and we have but an imperfect system of surface drainage. Cellars, as a rule, are dry. There are swamps in town, but not within a mile or two of any of the villages.

There is a slaughter-house near the edge of the village, which, this year, at least, has not in the least degree been a public nuisance; it was used but very little during the summer. The health officer inspects it frequently, and allows its use only on condition that it be maintained in a neat and clean condition, and free from odor.

The tannery of the Messrs. Wallace is not considered a nuisance by the board of health.

The school buildings in the village are well heated, lighted, and ventilated. There are five or six schoolhouses in the thinly settled districts of the town which are unfit for use.

The fire-escapes in the larger buildings are not remarkably good. The doors swing outward in most of the larger halls, but in only one instance, McDuffee Hall, is there more than one door of exit.

Health laws and regulations are adopted by the town. The board of health makes occasional inspections, and all complaints are given prompt attention. Our board makes a monthly report to the State Board of Health; physicians report promptly in cases of contagious diseases, we placard infected houses, public funerals are prohibited in deaths from diphtheria and scarlet fever, and disinfection of the dwelling is required where these diseases have prevailed.

A few surface drain-pipes have been laid during the year, and a few sink-spouts have been connected with drains. Owing to our imperfect drainage, the board of health considers this a doubtful improvement.

There is a special demand in this village, and has been for years, for a more complete sewerage system. We have a population now of 7,396; probably one half reside in the thickly settled portion of the village. It is a wonder that with such poor drainage, or rather lack of drainage, we do not have more sickness. Just think of a village of 4,000 or more inhabitants, nearly every street of which is as level as a floor, with no sewers, except a few in the thickest settled portion, to carry off surface water occasioned by rains and melting snow! If a good sewerage system is not needed here I do not know where one would be required. Another and about as important a sanitary need of Rochester is better drinking-water.

ROLLINSFORD — *Population*, 2,003.

HEALTH OFFICER. — E. S. Nowell.

Our water-supply for drinking and cooking purposes is from wells; for all other purposes, river water is forced by water-power to a stand-pipe, thence distributed by pipes. The well-water is very hard; contains iron; in most cases it is pure. No better supply is contemplated.

We have quite a complete system of sewerage for dwellings, about three fourths of the houses being connected therewith; the sewers are very well flushed. Very few cesspools. The town is naturally very well drained; cellars are mostly dry. No low lands or swamps near the village. No slaughter-houses constituting nuisances in town.

We have but one school building, and this contains a graded school. The building is well heated, lighted, and ventilated, special attention having been given to these points at the time of its construction, about forty years ago.

We have one public hall; this has no fire-escapes and none are very much needed.

The town does not adopt health regulations, but the board of health makes frequent sanitary inspections. We do not make a monthly report to the State Board of Health. Our physicians are very prompt to report the existence of contagious diseases; we do placard infected houses, we do prohibit public funerals in deaths from diphtheria and scarlet fever, and do re-

quire the disinfection of houses where these diseases have occurred.

There have been no particular sanitary improvements in town during the past year. Salmon Falls, a village in Rollinsford of about one thousand inhabitants, is owned and controlled almost wholly by the Salmon Falls Manufacturing Co. I have stated that the general drainage of the town is good, yet there are exceptions. Our soil is clay, and water stands on the surface for a long time in places where there is no slope to the land. Some cellars are not in good condition owing to the imperfect drainage. Sink drainage on the surface is also very troublesome in many instances, and very difficult to remedy. Farm dwellings, we believe, need no sanitary inspection.

RUMNEY — *Population*, 150.

BOARD OF HEALTH. — H. W. Herbert, B. H. Merrill, B. M. Craig, *Selectmen.*

We have no public water-works; each family depends upon spring or well water.

We have no sewers, and sink drainage is often discharged upon the surface of the ground and sometimes into uncemented cesspools. But very few of the cesspools are constructed upon sanitary principles. The conditions cannot always be satisfactory where there is no public sewerage.

Our town is naturally very well drained. Our cellars are generally dry, and all of them might be. The slaughter-houses are sufficiently remote from dwellings. Our schoolhouses are mostly of the old style and do not have the best heating and ventilating facilities.

Hotels and halls are well constructed to enable escape in case of fire, but having been built some time ago the doors swing inward.

The board of health acts only upon complaints or notices received. Our board does not invariably report to the State Board of Health, neither do our physicians always report contagious diseases to us. We do not placard infected houses, do not prohibit public funerals in cases of deaths from contagious diseases, neither do we require the disinfection of houses where these diseases have occurred.

There have been no sanitary improvements in town during the year, and none are necessary that can well be accomplished.

RYE — *Population*, 978.

BOARD OF HEALTH. — John O. Drake, Charles M. Remick, Daniel J. Parsons, *Selectmen.*

Our water-supply is mostly from wells. The water-supply of the Farragut House is pumped from a spring by windmill power, and is said to be of very fine quality.

There are two sewers at Rye beach, controlled by private parties. This town is naturally well drained, and most of the cellars are dry.

The town adopts no health regulations, and the board of health usually acts when complaints are received. Our board has reported promptly to the State Board of Health whenever there has been anything to report. Our physicians report at once in cases of contagious diseases; we placard infected houses, prohibit public funerals in deaths from diphtheria and scarlet fever, and require the disinfection of houses where such diseases occur.

At the town hall, a privy has been built separate from the building; it was formerly inside the building. Our town is supplied with first-class well-water, as a rule, but it has been clearly shown that typhoid fever has prevailed in families using polluted drinking-water. Several such wells have been abandoned, and the health of the family restored. From the fact that a large per cent of the cases of typhoid fever and diphtheria are caused by contaminated drinking-water, our people are satisfied that pure water is essential to good health, and take greater precaution to secure it. For five months past we have had no cases to report.

SALEM — *Population*, 1,805.

BOARD OF HEALTH. — E. A. Wade, M. D., Benjamin Chase, James M. Presby, M. D.

The town is supplied with water from individual wells and cisterns; the quality is variable. According to the report of the Massachusetts State Assayer, part of it is "unfit to water cattle."

It is clear when first drawn, but after standing all night, will stain a pail yellow indelibly; it is thought that it contains iron and sulphur, is hard, and acts as a cathartic on some persons. There is no public supply contemplated, although one could easily be secured, perfectly pure and in great abundance.

There is no complete system of sewers; most of the houses have drains, but in the main street of Salem Center many of the cellars are wet and cannot be drained, unless a large sewer is constructed, which would be a valuable investment and is much needed. A short system of sewers in each village in town would secure good drainage except in a very small portion of the village; dwellings situated on a swamp below Depot village, below the railroad, can secure dry cellars only by grading.

There are no nuisances in town in the way of offensive trades or slaughter-houses; the most troublesome nuisances are occasional uncleaned privy-vaults, but these are soon reported and usually attended to without delay.

The schoolhouses are about the average of civilized village schoolhouses, light and ventilation fair, although the latter point has rarely been regarded in their construction; the greatest trouble is in connection with the draught of the stove-pipes or chimneys; one of our best schools is frequently obliged to be dismissed because of the smoke and lack of heat. There is no provision whatever against fire in the hotels and public halls.

The board of health intends to follow the state laws as far as possible, but unless they are notified of nuisances these evils are seldom heeded. There have been no contagious diseases in town for years until this fall; since the first of October there have been six cases of scarlet fever, which have been kept isolated and thus confined to one house; should an epidemic occur, report would be sent at once to the State Board of Health.

There have been no sanitary improvements of any moment during the past year. The town needs a pure water-supply, especially at the Center village, and with it a system of sewerage whereby the cellars of Main street, Center village, could be kept clean and dry. The people should be educated to the recognition of these needs and should also learn the importance of clean and disinfected water-closets.

SANBORNTON — *Population*, 1,027.

BOARD OF HEALTH. — Edwin W. Lane, Lowell I. Hanson, Charles W. Wells, *Selectmen.*

The water-supply of the town is from wells and springs, of very good quality and in abundance; parties generally own or control their own supply. This being a farming community without a village of any fair size, a sewerage system is not practicable or necessary. The town is almost wholly well drained and the cellars of dwellings are dry.

The schoolhouses and public buildings are well constructed, with a view to good heat, light, and ventilation. The town hall is the only public hall, and there is no hotel.

The board of health acts upon complaints received, conformable to the laws of the State; monthly reports on contagious diseases are made to the State Board of Health, and on notification by physicians of the existence of any such cases, care is taken to prevent the spreading of the disease; the physicians are usually prompt to report, but should they neglect, any cases coming to the knowledge of the board of health are investigated and due care exercised.

No sanitary improvements have been accomplished within the last year and none are especially needed at present.

SANDOWN — *Population*, 475.

BOARD OF HEALTH. — James F. Sargent, *Selectman.*

The water-supply of the town is from private wells; the sewage is conveyed from the houses in drains. The town is fairly well drained naturally, the greater portion of the dwellings having dry cellars. The town is free from offensive trades, and the schoolhouses have the latest improvements in the way of heating, lighting, and ventilation.

The selectmen as board of health have issued health regulations, and prompt notification is received of any existing contagious disease from the attending physician. There have been no sanitary improvements in town within the last year, and none are needed at present.

SANDWICH — *Population*, 1,303.

BOARD OF HEALTH. — E. Q. Marston, M. D.

The town is supplied with water from wells and springs, the quality of which varies greatly; most of that from wells is hard; in the spring of the year nearly all the water in town is discolored. There is no movement toward a public water-supply even in the villages, of which there are three in town.

There are no sewers; the privies, which are used in all cases, are usually connected with the barn cellars; cesspools for sink drainage are rare, the sewage generally running out on the surface of the ground. The town is capable of good drainage naturally, but there are many damp cellars, in fact nearly all contain water for a time in the spring. There is no nuisance in connection with slaughter-houses.

The schoolhouses are not well heated, lighted, or ventilated. There are no public halls or new public buildings, and hence no fire-escapes.

No action is taken by the board of health except on complaints received; monthly reports of contagious diseases are made to the State Board of Health, and the local board is promptly notified of any such cases by the attending physicians. There have been no deaths from diphtheria or scarlet fever, but all houses in which these diseases have occurred have been disinfected, but not placarded. No sanitary improvements have been inaugurated during the past year.

SEABROOK — *Population*, 1,672.

BOARD OF HEALTH. — D. W. Colcord, M. D., C. B. Jackson, M. D., George R. Fellows, M. D.

The water-supply of the town is entirely from wells; it is never discolored, not very hard, contains some iron, is ample in quantity, but bad sometimes in the spring. There is only one sewer and cesspool in town, owned by a member of the local board of health; this one is well flushed, and the cesspool has open sides and bottom.

The town is poorly drained; a great many of the cellars are wet, and there are low lands near the village. Pig-pens and

privies are the only nuisances in town, there being no slaughter-house or offensive trade.

The schoolhouses are not well heated, lighted, or ventilated, and no attention has been given to these points in the construction of new ones. There are sufficient fire-escapes in connection with the hotels and public halls, but the doors of new public buildings open inward.

Health regulations have been adopted and issued by the town, but the board of health acts only upon complaints received ; the local board intends to make monthly reports of contagious diseases to the State Board of Health ; the physicians are prompt to notify the local board of any such diseases ; the infected houses have never been placarded, but public funerals are prohibited in deaths from diphtheria and scarlet fever, and houses in which these diseases have occurred are ordered disinfected.

No sanitary improvements have been undertaken within the past year, but the town has many sanitary needs.

SHELBURNE — *Population*, 336.

BOARD OF HEALTH. — John F. Cobb, L. T. Philbrook, James W. Browne, *Selectmen*.

The water-supply of the village is chiefly from driven wells and is clear and cold ; the farmers are principally supplied from springs, the water being brought to the houses in galvanized pipes, and is of good quality. There are no sewers in the village, the dwellings depending upon cesspools for sink drainage.

The town is well drained naturally ; the water-level is sufficiently low to secure dry cellars, and there are no low lands or swamps near the village. The regulations governing slaughter-houses are enforced and there is no nuisance connected with them, nor are there any offensive trades in town.

The schoolhouses are well heated, lighted, and ventilated, especial attention having been given to these points in the construction of the new ones. There are no public buildings in town, and the hotels and halls are provided with suitable fire-escapes.

The board of health acts only on complaints received ; no monthly reports of contagious diseases are sent to the State Board

of Health, although the local board receives prompt notification of any such cases from the attending physicians; infected houses are placarded, public funerals prohibited in deaths from diphtheria and scarlet fever, and houses in which these diseases have occurred are disinfected. There have been no sanitary improvements in the town within the past year; the village is small, with plenty of pure water and air, and good drainage, hence its wants in this direction are few.

SOMERSWORTH — *Population*, 6,207.

BOARD OF HEALTH. — John Emery, Enoch Whitehouse, Samuel Welch.

The water-supply for domestic purposes is obtained from wells; for fire purposes it is taken from the Salmon Falls river and raised to a reservoir and stand-pipe by the Great Falls Manufacturing Company, a private corporation. This reservoir water is used by some families for domestic purposes. The water-supply is not considered sufficient for the town, and a new supply is under consideration.

A system of sewers is now in process of construction. The location of the town is such that water will not stand on the surface; cellars can all be well drained into the sewer. There are no swamps near the village. No nuisances in connection with slaughter-houses or other offensive trades. Our schoolhouses and public buildings are well heated, lighted, and ventilated. One schoolhouse is now in process of construction.

The town adopts no special health regulations. The board of health make inspections when their attention is called to the matter. Regulations in connection with infectious and contagious diseases are attended to.

We think our system of sewers will, when completed and used by the citizens, afford all the drainage needed, and in other respects the town is in good sanitary condition. The sewer system is the chief sanitary improvement of the year.

SOUTH HAMPTON — *Population*, 370.

BOARD OF HEALTH. — Joseph J. J. Sawyer, Roscoe H. Morrill, James W. Purinton, *Selectmen*.

The water-supply of the town is chiefly from wells, some of which perhaps are too near the buildings for purity, but as the soil in most localities is of a hard, rocky nature, this danger is greatly reduced. The natural drainage of the town is generally good, but the greatest trouble with wet cellars is on top of the hills or high lands. There is no offensive trade in town.

The schoolhouses are all of modern build and constructed with a view to good light and ventilation, and are heated by wood stoves. The only public building of any account in town is the town hall, whose doors are hung to swing outward.

The town has no sanitary regulations whatever, and inspections are made only on complaints received, and these are of rare occurrence. No report of contagious diseases has been received by the present board of health; there is no resident physician, but blanks of notification were sent to all physicians in the vicinity, and doubtless any such diseases would be reported at once should any occur. There have been no sanitary improvements undertaken in town during the last year; it is considered a very healthful locality, in a population of 370 there being seventeen persons between eighty and ninety years of age; yet the board of health realizes the sanitary dangers that may come to any community, such as the pollution of drinking-water, and feels that too much care cannot be taken in the matter of sink-drains, privies, and the like.

SOUTH NEWMARKET — *Population*, 855.

BOARD OF HEALTH. — George W. Paul, *Selectman*.

The water-supply is from wells and cisterns; there are no sewers. The town is fairly well drained naturally; there are no slaughter-houses or offensive trades. The schoolhouses and public buildings are provided with good heat, light, and ventilation. There are no fire-escapes in town.

The board of health acts only upon complaints received; a monthly report of contagious diseases is made to the State Board

of Health if there are any such to return. There have not been any sanitary improvements undertaken in town during the past year, although a great deal is needed in this direction.

SPRINGFIELD — *Population*, 540.

BOARD OF HEALTH. — Charles McDaniel, Jonathan Sanborn, Albert Morrill, *Selectmen.*

The water-supply of this town is mostly from private springs, through lead pipe. There is no large village in town.

We have private sewers and cesspools. The town is hilly and well drained; no low lands or swamps near village. No slaughter-houses near village or elsewhere to be offensive.

Our schoolhouses are well heated, lighted, and ventilated. We have no need of fire-escapes.

The town does not adopt health regulations, and the board of health makes no inspections unless called upon. We do not make a monthly report to the State Board of Health, as we have had no contagious diseases in a long time.

There have been no sanitary improvements in town during the past year. This is a very healthful town, and we have no suggestions to make in regard to sanitation.

STARK — *Population*, 703.

BOARD OF HEALTH. — W. T. Pike, E. R. Forbush, A. A. Potter, *Selectmen.*

The water-supply of the town is chiefly from springs, but a few wells are in use. There is no system of sewerage or drainage. The cellars of the buildings are fairly dry; there is a swamp near the village, but no evil effects from it were ever known. There are no slaughter-houses or offensive trades.

The schoolhouses are fairly heated and well lighted and ventilated; particular care was taken in the construction of two new schoolhouses in 1889 to secure good lighting and ventilation, the house with two schoolrooms, at the village, being considered a model of its kind. No fire-escapes are needed in connection with the hotels and public halls.

The town has no local health regulations, being governed by the statute laws. The board of health does not make monthly

reports to the State Board of Health. No sanitary improvements have been undertaken within the past year; the village needs an ample supply of pure aqueduct water, and there are a few wells now used which should be analyzed, as their purity is certainly questionable.

STEWARTSTOWN — *Population*, 1,002.

BOARD OF HEALTH — Thomas H. Van Dyke, Jeremiah N. Keazar, Byron Drew, *Selectmen*.

The town has a pure water-supply from wells and aqueducts. There is very good sewerage at the county institutions and perhaps that is all that is needed. The town is naturally well drained and there are no low lands that are troublesome near the village. There is no nuisance connected with slaughter-houses and there has never been any occasion for enforcing regulations governing them; no other offensive trade in town.

The schoolhouses and public buildings are well heated, lighted, and ventilated, and especial attention has been given to these points in the construction of new schoolhouses. The county institutions are provided with fire-escapes. No public buildings have been erected for some time.

The town has never adopted any health regulations; occasional sanitary inspections are made by the board of health, who also would act upon any complaint received. No monthly reports of contagious diseases are made to the State Board of Health and there has not been any such case in town during the past year. There have been no sanitary improvements undertaken lately and there are no particular needs, as this is a very healthful town with a good climate.

STODDARD — *Population*, 400.

BOARD OF HEALTH. — Josiah M. Rice, *Selectman*.

This town is well furnished with very pure water; a great many dwellings are supplied with running water from springs among the hills; nearly all soft. There is no sewerage or cesspools of any kind. The town is naturally well drained; there is no swamp near the village, but the mill village is at the foot of the reservoir pond, so that when the water is drawn off some-

times there is an unpleasant odor and perhaps the atmosphere is contaminated. There are no slaughter-houses or offensive trades in town.

All the schoolhouses and public buildings are well heated and ventilated; no attention has been given to the subject of fire-escapes, as there is no building more than two stories in height; no doors in town swing outward.

The town has not adopted any health regulations, and the board of health acts only upon complaint. Monthly reports on contagious diseases are made to the State Board of Health, and the physicians promptly notify the local board of any such cases; there has been no opportunity for placarding infected houses or prohibiting public funerals. There have been no sanitary improvements during the past year; there has been no case of contagious disease in town during that time, although in some past years diphtheria and typhoid fever have prevailed to an alarming extent. The houses are at a sufficient distance from each other to secure plenty of pure air, and with an abundance of pure water the sanitary wants of this town are few.

STRAFFORD — *Population*, 1,304.

BOARD OF HEALTH. — Warren H. Perkins, John H. Jewell, John F. Hall, *Selectmen*.

The water-supply of the town is wholly from wells. There are no sewers. The town is well drained naturally. There is one small village at the outlet of Bow lake, but there are no low lands or swamps near it, and the water-level is low enough to secure dry cellars in nearly all localities in town. There are no slaughter-houses that constitute a nuisance, nor any offensive trades; consequently there is no need of enforcing the regulations concerning these.

The schoolhouses are well heated, lighted, and ventilated, and especial attention is given to these matters in the construction of new buildings for school purposes. There are no fire-escapes in town. All of the public buildings were built some years since, and the doors all swing inward.

The town has never adopted any health regulations, and the board of health acts only upon complaint. No monthly reports

of contagious diseases are made to the State Board of Health, and the physicians do not notify the local board of the existence of any such diseases. No especial care is taken to control such diseases, by requiring disinfection, private funerals, etc.

There have been no sanitary improvements within the past year; the greatest need in this direction is pure drinking-water; at present, in many instances the sink-drains, privies, and hog-pens are so near the wells that serious pollution is inevitable.

STRATFORD — *Population*, 1,128.

BOARD OF HEALTH. — John C. Pattee, James Blanchard, M. D., Samuel Brown.

The principal water-supply of the town is from an aqueduct owned by private individuals; a few houses are furnished from wells. The aqueduct water is of very good quality throughout the year, is never discolored, contains no perceptible amount of iron, is soft, and ample in quantity; having its source in springs on hills one mile distant from the village, it is undoubtedly pure. Some of the wells also furnish good pure water, but others are rapidly being abandoned for aqueduct water.

A very good system of sewerage has been constructed during the past summer, and a large proportion of the houses are already connected therewith, but there is at present no means of flushing the sewers. A few other buildings have private drains to the river; no cesspools are used; a few detached buildings have no sewerage except surface drainage. The village is well drained naturally, the cellars of the buildings are dry, and there is but little low land in the vicinity, while the nearest swamp is across the river in Vermont. The slaughter-houses are at a distance from the village, and are in no way a nuisance; no other offensive trades in town.

All of the schoolhouses are fairly well heated, lighted, and ventilated. There are no very large public buildings. But little attention is given to fire-escapes, but none of the hotels or public halls are particularly dangerous in case of fire; those erected lately, including new schoolhouses, have doors hung to swing outward.

The town has not adopted any health regulations, and the board of health has only acted on complaints received, or when

requested to inspect certain localities. No monthly reports of contagious diseases have been made to the State Board of Health, and no notification of the existence of any such diseases has been received by the present board of health, hence no work has been required in this direction.

Within the past year a complete system of sewerage has been inaugurated, and a large portion of the sink and some of the water-closet drainage has been connected; some means of flushing these sewers should be arranged, the remaining buildings should be connected, and in a few instances well-water should be abandoned for aqueduct water.

STRATHAM — *Population*, 680.

BOARD OF HEALTH. — James W. Rollins, Charles W. Scott, George W. Dixon, *Selectmen.*

Stratham is almost exclusively a farming town, land generally high and well-drained; the village is small, with no swamps near, and the cellars of the dwellings usually dry. There is one slaughter-house in town, but it is conducted in a proper manner; no other offensive trades in town, not even rum-selling.

The town contains four schoolhouses, three churches, and a town hall, all of which are well heated, lighted, and ventilated, especial attention having been given to these points in the construction of the schoolhouses. None of these buildings are of recent erection, hence the doors swing inward.

The town has never adopted any health regulations, and the board of health acts only upon complaints received. No monthly reports of contagious diseases are made to the State Board of Health, although the physicians promptly notify the local board of the existence of any such disease; in extreme cases, infected houses have been placarded, and public funerals in deaths from diphtheria and scarlet fever have been forbidden in a few instances; houses in which these diseases have occurred are required to be disinfected.

There have not been any public sanitary reforms in the town during the past year, and there are no particular needs at present. A great sanitary change has taken place in the town within the last thirty or forty years in regard to the condition of farm

buildings and their surroundings; then, pig-pens and sink-spouts deposited their filth anywhere about the premises; but the farmers have learned to locate pig-pens and cattle-yards, as well as barns, lower than the houses, with the drainage from the dwellings, and as a result, fevers and contagious diseases are much less frequent.

SULLIVAN — *Population*, 337.

BOARD OF HEALTH. — Henry W. Hubbard, *Selectman*.

The town has an abundant supply of good water from wells; it is soft and contains no iron. There are no sewers, and the greater portion of the dwellings have open drains for sink drainage. The town is naturally well-drained, with no swamps near the village, and the water-level is sufficiently low to secure dry cellars. There are no slaughter-houses or offensive trades.

The schoolhouses are old structures, but are well heated, lighted, and ventilated. The town contains no public buildings, hence there are no fire-escapes.

There are no established health regulations, and the board of health acts only upon complaints received. Physicians promptly report to the board any contagious disease prevailing in the town, but no monthly report of the same is made to the State Board of Health; infected houses are not placarded, public funerals are allowed in deaths from diphtheria and scarlet fever, and no disinfection of the houses in which these diseases have existed is required by the board of health. There have been no sanitary improvements in town within the past year.

SUTTON — *Population*, 849.

BOARD OF HEALTH. — George C. Pillsbury, John S. Andrews, George Robertson, *Selectmen*.

We have no public water-supply and none is contemplated. There are no villages of much size in this town. Our town is naturally well drained; most cellars are dry, and there are no swamps near the villages.

Our slaughter-houses do not constitute nuisances, although no regulations relating to such are enforced. No offensive trades in

town. Our schoolhouses are well heated, lighted, and ventilated. No hotels in town, hence no fire-escapes.

The town does not adopt and issue health regulations; the board of health acts on complaints only. We report to the State Board of Health when there is anything to report. Do not know that there have been any cases of diphtheria or scarlet fever in town during the past year.

SWANZEY — *Population*, 1,600.

BOARD OF HEALTH. — Frank S. Faulkner, Joseph L. Starkey, Norris C. Carter, *Selectmen*.

The water-supply of the town is from wells and private distribution pipes, no public supply existing or contemplated. There are no public sewers, the sink drainage usually running into drains; the soil is sandy and absorbs this sewage readily.

The town has a good natural drainage; there is considerable low land near the village, but no swamps; the dwellings generally have dry cellars. There is no nuisance connected with slaughter-houses or any other offensive trade in the town, hence the regulations governing these have not been enforced.

The schoolhouses and public buildings are well heated, lighted, and ventilated, and especial care was taken to produce good results in these points in newly erected schoolhouses. No fire-escapes in town, and no new public buildings.

No regulations for sanitary matters have ever been adopted by the town, and the board of health acts only upon complaints received. The physician notifies the local board immediately when any contagious disease exists, but no monthly report of such cases is made to the State Board of Health; no public funeral has been held in deaths from diphtheria or scarlet fever, and disinfection of the houses in which these diseases have occurred has been required. There have been no public sanitary improvements within the past year.

TAMWORTH — *Population*, 1,025.

BOARD OF HEALTH. — Francis P. Remick, A. E. Wiggin, *Selectmen*.

There is no public water-supply or system of sewerage in town, and the natural drainage is poor. There are no slaughter-houses

or offensive trades in town. The schoolhouses are well heated, lighted, and ventilated, and especial attention has been given to these points in the construction of new ones. There are no fire-escapes in town.

The town has never adopted any health regulations; no monthly reports of contagious diseases have been made to the State Board of Health, although the physicians are prompt to notify the local board of the existence of any such cases; infected houses are placarded, public funerals are not allowed in deaths from diphtheria or scarlet fever, and houses in which these diseases occur are disinfected.

There have been no sanitary improvements within the past year.

TEMPLE — *Population*, 342.

BOARD OF HEALTH. — *Board of Selectmen.*

The water-supply of the town is from wells and an aqueduct. There are no sewers and the natural drainage of the town is good. There are no slaughter-houses that constitute a nuisance, nor are there any other offensive trades in town. The schoolhouses and public buildings are in good sanitary condition and there are none that need fire-escapes.

The board of health acts upon all complaints received; the physicians promptly notify the local board of any existing contagious diseases, but no monthly report of such cases is made to the State Board of Health; however, proper precautions are taken. Infected houses are placarded, public funerals prohibited in case of deaths from diphtheria or scarlet fever, and disinfection of houses in which these diseases have occurred is required. There have been no sanitary reforms inaugurated within the past year and at present none are needed.

THORNTON — *Population*, 632.

BOARD OF HEALTH. — Frank A. Barnard, *Selectman.*

The water-supply of the town is from wells; no public supply has been contemplated. There are no sewers. The town is naturally well drained, and there are no swamps near the village. There are no slaughter-houses or offensive trades in town.

The schoolhouses and public buildings are supposed to be well heated, lighted, and ventilated; there are no fire-escapes in town.

There are no established health regulations, and the board of health acts only upon complaint; the board has never received any notification from a physician of the existence of any contagious disease, and there has been no case of diphtheria or scarlet fever during the term of the present board. No sanitary improvements have been undertaken lately.

TILTON — *Population*, 1,521.

BOARD OF HEALTH. — Courtland Boynton, R. T. Noyes, Fred A. Wilkins.

The water-supply of the town is from wells and from distribution pipes owned by a private company; it is of good quality and abundant, never discolored or bad at any season of the year, is soft, contains slight trace of iron, and is from a source of undoubted purity.

At present there is no complete sewerage system, but the matter is under consideration; there are some private drains to the river, but seven eighths of the dwellings depend upon cesspools for sink drainage, and these are chiefly holes in the ground. The water-level of the town is low enough to secure dry cellars, and there are no swamps or low lands near the village.

The regulations governing slaughter-houses are enforced and consequently there are none constituting a nuisance, neither is there any other offensive trade in town. The fire-escapes in connection with the hotels and public halls are not sufficient, and the town hall has no means of ventilation other than windows; the doors of all new public buildings are constructed to swing outward.

The town has adopted no sanitary regulations, and the board of health acts only when called upon. The physicians are negligent in reporting cases of contagious diseases to the board of health, and no monthly returns are made to the State Board of Health; public funerals are allowed in deaths from diphtheria and scarlet fever, and disinfection of houses in which

either of these diseases has prevailed is not required by the board.

A plan for a complete system of sewerage has just been procured and if it is executed the village will be in a good sanitary condition.

TROY — *Population*, 999.

BOARD OF HEALTH. — M. T. Stone, M. D.

The water-supply of the town is entirely from wells; no public supply is now contemplated. There is no system of sewerage; a few houses have cesspools with open bottoms, but nearly all sink drainage is discharged on the surface of the ground.

The location of the town affords good natural drainage; most of the cellars of the buildings are dry, and the only low lands near the village are small meadows. There is no slaughter-house near enough to a dwelling to be offensive.

The schoolhouses were all erected years ago, and are heated by stoves and well lighted, but doors and windows are almost the only means of ventilation. There are no buildings in town provided with fire-escapes, and no public buildings have been built lately in the town.

The town has issued only the regulations of the State Board of Health, and the local board of health acts only upon complaints.

Monthly reports of contagious diseases are made to the State Board of Health and all regulations of that board are enforced as much as possible by the local authorities. There have not been any sanitary improvements undertaken in town within the past year, although a public water-supply would be of great benefit and value if such could be obtained.

TUFTONBOROUGH — *Population*, 767.

BOARD OF HEALTH. — N. F. Hodgdon, E. D. Wiggin, M. D. L. McDuffee, *Selectmen*.

The water-supply of the town is from wells; there are no sewers. The natural drainage of the town is good; there are no low lands or swamps near the village and the water-level is sufficiently low to secure dry cellars. There being no nuisance in

connection with slaughter-houses, there is no need of enforcing regulations concerning them.

In most instances the schoolhouses and public buildings are well heated, lighted, and ventilated, and are furnished with all the fire-escapes that are necessary.

The town has never adopted any health regulations, and the board of health acts only upon complaints received. No monthly reports concerning contagious diseases are made to the State Board of Health, although the local board receives prompt notification of any such cases from the physicians. Infected houses are placarded, those in which diphtheria or scarlet fever have occurred are required to be disinfected, and public funerals are forbidden in deaths from either of these diseases. No sanitary reforms have been accomplished in the town within the past year and none are needed at the present time.

UNITY — *Population*, 653.

BOARD OF HEALTH. — Philip Ham, Frank Wright, William R. Burt, *Selectmen.*

The water-supply of the town is principally from wells and is hard; a few families are furnished from springs. There are no sewers or cesspools in the town; the natural drainage of the town is good, the water-level is sufficiently low to insure dry cellars, and there are no swamps or low lands near the village. There are no slaughter-houses that constitute a nuisance nor are there any offensive trades in town.

The schoolhouses and public buildings are well heated, lighted, and ventilated, and especial attention was given to these sanitary points in the construction of recent schoolhouses. The hotels and public halls are well provided with fire-escapes, and there are no new public buildings in town.

The town has adopted and issued health regulations and the board of health makes occasional sanitary inspections, as well as taking action upon all complaints received. No monthly reports are made to the State Board of Health concerning contagious diseases, neither do the physicians notify the local board promptly of the existence of any such cases; infected houses have never been placarded, but public funerals are prohibited in

deaths from diphtheria and scarlet fever, and disinfection of houses in which these diseases have occurred is required.

WAKEFIELD — *Population*, 1,528.

BOARD OF HEALTH. — A. F. Wood, F. B. Shorey, E. E. Brown, *Selectmen.*

The water-supply of the town is from wells; there is no sewerage system. The slaughter-houses of the town are such as to constitute a nuisance. There are no fire-escapes on any building in town.

The town has never adopted any health regulations, and the board of health acts only upon complaints received. No monthly reports of contagious diseases are made to the State Board of Health, although the physicians promptly notify the local board of any such cases existing; infected houses are placarded, private funerals required in deaths from diphtheria and scarlet fever, and disinfection of houses which have contained either of these diseases is ordered. In August, 1890, one case of diphtheria occurred; the patient recovered, and the house or shop was disinfected. No sanitary improvements have been undertaken within the past year.

WALPOLE — *Population*, 2,163.

BOARD OF HEALTH. — J. L. Hubbard, M. O'Connor, W. B. Porter, M. D.

The greater portion of the town is furnished with water from various aqueducts supplied by springs in the neighboring hills; the remainder are furnished from wells; the supply is generally sufficient in quantity, is good, soft water, containing no iron and fairly pure, furnished by private enterprise, and no public supply has been considered.

There are no sewers; every one must depend upon cesspools or some other method of disposing of sink drainage or else allow it to be deposited on the surface of the ground. There is but one cesspool in town that is cemented; the overflow of this one is carried into a brook. There are also a few sinks connected with surface drains.

The town is hilly and well drained, and the cellars of the

dwellings are generally dry; no swamps or low lands near the village. The regulations governing slaughter-houses are enforced and the three located in the town are examined occasionally by the board of health; suggestions are made and carried out. Only one of these buildings is within the village limits.

The schoolhouses as a whole are well heated, lighted, and ventilated, but most of them were constructed before the law was passed requiring that doors should swing outward.

The town issues health regulations, and this year several hundred circulars were printed and distributed through the town by mail with the intention that every family should receive one; but few inspections except on complaints are made by the board of health.

Monthly reports are made to the State Board of Health of all existing contagious diseases, and the physicians are prompt to notify the local board whenever such diseases prevail; infected houses have been placarded in the compact parts of the town, but not when located in isolated places. Disinfection of houses in which there have been cases of diphtheria or scarlet fever is not always required, but public funerals were forbidden in two deaths from these diseases, the only ones that have occurred.

Public sewers are greatly needed in the town; there are some localities in which it is difficult to secure good sanitary conditions at present and sewers would be of great value; the subject has already been agitated with a view of having the town adopt the sewerage act.

WARNER — *Population*, 1,383.

HEALTH OFFICER. — B. F. Heath.

There is no public water-supply in the town, and none is contemplated at the present time; the residents are furnished from wells and springs, chiefly the latter, from which the water is conveyed to the houses in lead pipes, but as the flow is continuous, and the water of a character that it does not act upon the metal, it is believed to be unpolluted. A few of the wells are not above suspicion, but generally the water is thought to be good, and it is never discolored.

There is no sewerage system, but the villages are situated on a

hill on the banks of a river, hence the opportunity for natural drainage is excellent. As a whole, the methods of disposal of sewage are as good as at the average country village, but there is yet considerable room for improvement, both in the villages and on the farms.

There is but one slaughter-house, and that is so situated that it is unobjectionable; no other offensive trades in town.

Under the operation of the school law of 1885, the school-houses are being improved and reconstructed as fast as practicable, with modern improvements added. It is to be regretted that as a rule no thought is given to the matter of fire-escapes. The largest public building, the town hall, has doors hung to swing outward; one of the churches has doors swinging inward, but as the audience room is on the ground floor, escape through windows could be made easily.

No health regulations have been adopted by the town, and as a rule the board of health acts only upon complaints received. No contagious disease has prevailed in the town since the appointment of the present health officer.

There have been no marked sanitary improvements within the past year, but it is believed that there is an increasing interest in the matter among the people; there seems to be but little need of works of a public character, but abundant need of eternal vigilance on the part of every householder in studying the situation, and continually watching every nook and corner of his premises for sources of disease germs, which are none the less dangerous because obscure.

WARREN — *Population*, 875.

BOARD OF HEALTH. — George M. Williams.

The water-supply of Warren is from private wells, and from distribution pipes furnished by a private company; the public supply is of good quality, soft, never discolored, ample in quantity, and of undoubted purity, coming from a spring.

There is no system of sewers; in a very few instances cesspools are in use, made by sinking barrels part way into the ground; other dwellings have wooden sewers carrying the sink drainage a short distance from the house. One has a tile pipe for convey-

ing the sewage, but the majority of the residents allow the sink-water to dischage upon the surface of the ground, to sink into the soil as it will.

The village is situated on high ground with good opportunity for natural drainage as well as for a system of sewerage, with no swamp land near; with a few exceptions, the water-level is low enough to secure dry cellers. There are no slaughter-houses or offensive trades within the village.

The schoolhouses are warmed by stoves, and no attention has ever been given to the subject of ventilation, but as the schools are all small, very good air can be secured by doors and windows. There are no new public buildings in the town, and all outside doors swing inward; neither are there any fire-escapes on any building.

The town has not adopted any health regulations, and the board of health acts only upon complaints. Monthly reports of contagious diseases have not been made to the State Board of Health, and no such diseases have occurred in town; but should any exist, due precautions would be taken by the local board to prevent the spreading of the disease.

Within the past year a slaughter-house has been removed from the village. Some different arrangement should be made for the disposal of sink drainage and privy sewage. Some change for the better should also be made in regard to the ponds in the village. There is a river on one side of the village, and a brook on the other; three mills are located on the brook, with a pond at each; at the upper one the bottom of the pond is mud, the accumulation of years, and when the water is drawn off, this filth emits unwholesome, sickening odors; the other two ponds have been gradually filling in with sawdust for years, so that now they contain but little water, and with this withdrawn, the decaying sawdust is very foul and offensive. These nuisances should be abated, and the board of health has ordered the owner of the upper mill not to draw off the water and expose the mud.

WASHINGTON — *Population*, 569.

BOARD OF HEALTH. — George N. Gage, M. D.

The town is supplied with water from wells and private aqueducts; there is no public supply. The water is generally very

pure, ample in quantity, and soft. There is no public system of sewerage. The people are just beginning to realize the necessity of a proper disposition of their sewage, and some well-constructed underground sewers have been laid from private residences.

The town is hilly and naturally well drained; there are no extensive swamps within half a mile of the village. There is no nuisance in connection with slaughter-houses.

The schoolhouses and public buildings are well heated, lighted, and ventilated, and the hotels and public halls are provided with sufficient fire-escapes.

The board of health has never acted except when requested to do so, but would if necessary. Monthly reports of contagious diseases are made to the State Board of Health; infected houses in farming districts are not placarded, but neighbors are not allowed to enter the dwelling unless to care for the sick; private funerals and disinfection are required in cases of diphtheria and scarlet fever.

Greater care is needed in the disposition of sewage and the location of vaults and outhouses. Many people do not realize the necessity of guarding their wells from every possible source of pollution. The State Board of Health and physicians can in time increase the public interest in this matter.

WEARE — *Population*, 1,550.

BOARD OF HEALTH. — *Board of Selectmen.*

The water-supply of the town is from wells; there are no sewers in the town, but the natural drainage is good. There are no slaughter-houses or offensive trades. The schoolhouses, which are the only public buildings, are poorly ventilated, but are provided, as are the hotels and public halls, with all the fire-escapes that are needed.

The town has not adopted any sanitary regulations, and the board of health acts only upon complaints received. The physicians promptly notify the board of any existing case of contagious disease, but no monthly report of such diseases is sent to the State Board of Health; infected houses are placarded, but public funerals are allowed in deaths from diphtheria and scarlet fever, and houses in which these diseases have occurred are

not ordered disinfected. There have been no sanitary improvements undertaken in the town during the past year, and none are needed at present, as the town is in a very good sanitary condition.

WEBSTER — *Population*, 564.

BOARD OF HEALTH — Warren Abbott, I. A. Call, T. S. Whittier, *Selectmen.*

The water-supply of Webster is almost entirely from wells; there are only five families that are furnished by distribution pipes; no public supply. The water contains some iron, on the whole is rather hard, of very good quality, from a pure source, and abundant in quantity. There are no sewers in town, and as there is no village none are needed. The natural drainage is sufficiently good for health. There is no nuisance in connection with slaughter-houses nor are there any offensive trades in town.

The schoolhouses and public buildings are well heated, lighted, and ventilated; the town has no hotel, and the public halls are on the first floor, and in case of fire the occupants could go out the windows. Doors open inward, but the hall was built a hundred years or more ago.

The town has not adopted any health regulations; the board of health makes no sanitary inspections, but would act upon any complaint received. There are but few cases of contagious diseases in town, and no monthly reports in regard to them are made to the State Board of Health; have had no cases of scarlet fever, and when diphtheria prevails every one keeps at a distance from the infected house. No sanitary improvements have been made within the past year and none are needed at present.

WENTWORTH — *Population*, 698.

BOARD OF HEALTH. — F. A. Durkee, M. D., John A. Davis, John W. Lyon.

The water-supply of the town is from wells and springs, soft and of good quality, and does not usually contain much iron. There are no sewers. The town is considered well drained; there are but very few wet cellars, and no swamps near the village. There are no offensive trades in town.

The schoolhouses and public buildings are poorly ventilated; the hotels and public halls seem to be provided with sufficient fire-escapes; no public buildings have been erected lately.

The board of health acts only upon complaints received; no monthly reports of contagious diseases have been made to the State Board of Health, owing to the fact that none have occurred during the term of office of the present board. There have been no sanitary improvements within the past year and none are needed at present.

WILMOT — *Population*, 840.

BOARD OF HEALTH. — Fred E. Goodhue, George B. Tewksbury, *Selectmen.*

The town is supplied with water from private wells; no public supply is contemplated at present. There is no system of sewerage. The natural drainage of the town is good, although the water-level is not low enough to secure dry cellars in all localities, and there is a meadow in one village. There are no slaughter-houses or offensive trades in town.

The schoolhouses are well heated, lighted, and ventilated; there are not sufficient fire-escapes in connection with the hotels and public halls.

The board of health acts only upon complaints received; no monthly reports of contagious diseases are made to the State Board of Health, and the physicians are not prompt in notifying the local board of the existence of any such cases. Placards are placed on infected houses, private funerals are required in deaths from diphtheria and scarlet fever, and houses in which these diseases have occurred are ordered disinfected. There has been no especial sanitary progress during the past year, and the town is so thinly populated that the needs in this direction are confined to individual households.

WILTON — *Population*, 1,850.

BOARD OF HEALTH — George W. Hatch, M. D., Moses Clark.

The water-supply of the town is from springs on a hill just north of the village; it is good, soft, clear water, always abundant in dry times and always pure. A very few wells are used

A gravity system sufficient to supply the entire town could be secured by piping about a quarter of a mile.

There is no sewerage system; almost all the dwellings depend upon cesspools for sink drainage and these are nearly all poorly constructed. A greater portion of the village is on the left bank of the Souhegan river, raised above its level, and consequently has a good opportunity for natural drainage. The only offensive trade in town is a piggery about eighty rods east of a part of the village, which is quite objectionable when east winds obtain.

The schoolhouses are in a very bad condition; they are poorly constructed, lighted, and heated, with no ventilation whatever aside from doors and windows, while there is not nearly room enough for the number of scholars. The hotels and public halls are suitably furnished with fire-escapes, and the doors of public buildings swing outward.

The town has never adopted any health regulations, and the board of health does nothing if it can help it. No monthly reports of contagious diseases are made to the State Board of Health, and the physicians do not send proper notifications of existing cases of such diseases; infected houses are placarded, public funerals are forbidden in deaths from diphtheria and scarlet fever, and disinfection of houses in which these diseases have occurred is required. No sanitary improvements have been inaugurated within the past year, but a system of sewers is needed. A good water-supply could also be procured at a slight expense.

WINDHAM — *Population*, 632.

BOARD OF HEALTH. — Albert E. Simpson, Caleb B. Clark, John A. Moore, *Selectmen.*

The water-supply of the town is from wells and springs and is of good quality; there is no system of sewerage. The town is naturally drained by brooks and water-courses; there is a meadow near the village with houses built on its edge, where, in summer mornings, fog lies over the meadow and houses later than on the higher lands, and the atmosphere is laden with dampness that would indicate unhealthfulness.

There are no offensive trades in town and only one place

where animals are slaughtered, and that on a farm, and plenty of absorbents are used to keep the place in a good condition.

Five out of the seven schoolhouses in town were built thirty-five or forty years ago, and were very good for that time as regards ventilation, but have not the latest improved methods; with plenty of wood there is no trouble about heating. There is no hotel in town; the church and town hall are on the ground floor, so that the dangers in case of fire are small. No public buildings have been erected since the law was passed requiring doors of public places to swing outward.

The town has never adopted any health regulations; the board of health does not make any regular inspections, but when a nuisance exists rumor soon gives them notice. Monthly reports of contagious diseases are generally made to the State Board of Health; the physicians promptly notify the local board of the existence of any such diseases and the infected house is placarded; no deaths have occurred from diphtheria or scarlet fever since the term of office of the present board, but disinfection of the premises has been required under the direction of the attending physician whenever either disease has prevailed.

There have been no sanitary improvements undertaken in the town within the past year; better text-books in regard to the laws of health are needed for our common schools.

WINDSOR — *Population*, 62.

BOARD OF HEALTH. — George M. Russell, Herbert F. Dresser, John G. Dodge, *Selectmen.*

The water-supply of the town is from wells. There is no system of sewerage. The natural drainage of the town is good, with the water-level low enough to secure dry cellars. There is no nuisance in connection with slaughter-houses.

The schoolhouses and public buildings are well heated, lighted, and ventilated; and the hotels and public halls are provided with sufficient fire-escapes.

The town has no established health regulations, and the board of health acts only upon complaints; no monthly reports of contagious diseases are made to the State Board of Health, although the physicians are prompt to notify the local board of the preva-

lence of any such cases; disinfection of houses in which diphtheria and scarlet fever have occurred is required. There have been no sanitary improvements within the past year, and none are needed at present.

WOLFEBOROUGH — *Population*, 3,020.

BOARD OF HEALTH. — John G. Cate.

Wolfeborough has an ample supply of excellent water from Beech pond, furnished by the town. There is no complete system of sewerage; there is one large sewer about a fourth of a mile long, and a few houses are connected with it. Only a small portion of the dwellings depend upon cesspools for sink drainage, which have open sides and bottom.

The town is not well drained naturally; the water-level is low enough to secure dry cellars in most localities, but there are about twenty-five acres of swamp land between Wolfeborough village and Mill village. There is one slaughter-house about a fourth of a mile from one part of the village; the regulations are not strictly enforced.

In the construction of new schoolhouses especial attention has been given to heat, light, and ventilation, but perhaps the schoolhouses and public buildings taken as a whole are not well ventilated. The doors of public buildings built recently swing inward, and sufficient fire-escapes are not provided.

Health regulations have been adopted and issued by the town; the board of health makes occasional sanitary inspections, and also acts upon all complaints received. The physicians promptly notify the board of all existing cases of contagious diseases, and a monthly report of the same is sent to the State Board of Health; placards are placed upon infected houses, public funerals are prohibited in deaths from diphtheria and scarlet fever, and houses in which these diseases have prevailed are disinfected.

WOODSTOCK — *Population*, 341.

BOARD OF HEALTH. — D. B. Baston, Lucien Smith, W. L. E. Hunt, *Selectmen*.

The water-supply of the town is from wells and springs, brought to the dwellings in distribution pipes. There is not a

complete system of sewerage, and the greater portion of the houses depend upon cesspools with open sides and bottom for sink drainage. The natural drainage of the town is good, the water-level being low enough to secure dry cellars, and with no low lands or swamps near the village. There are no slaughter-houses that constitute a nuisance.

The schoolhouses and public buildings are well heated, lighted, and ventilated, and the hotels and public halls are provided with sufficient fire-escapes.

The town has never adopted any health regulations, and the board of health acts only upon complaints received. There have been no cases of contagious disease in town during the past year, and no monthly reports in regard to the same have been made to the State Board of Health. There have been no sanitary improvements in town within the past year.

AMERICAN PUBLIC HEALTH ASSOCIATION.

SEVENTEENTH ANNUAL MEETING.

REPORTED BY DR. G. P. CONN, DELEGATE FROM THE STATE BOARD OF HEALTH.

The seventeenth annual meeting of the American Public Health Association was held in Brooklyn, N. Y., and there was a full attendance from all sections of the country.

The session was opened at eleven o'clock, Tuesday, October 21, 1889, in the Brooklyn Institute, where most of the sessions were held. A distinguished gathering of physicians, civil engineers, and other professional men and laymen from all parts of the country interested in sanitary matters were in attendance. The objects of the association are the advancement of sanitary science and the promotion of organizations and measures for the practical application of public hygiene.

The meeting was opened by the president, Dr. Hosmer A. Johnson, of Chicago, and Dr. J. H. Raymond, chairman of the local committee of arrangements, gave a brief address of welcome and announced the arrangements for the reception and entertainment of the members.

The first paper presented the association was prepared by Dr. William Thornton Parker, of Newport, R. I., and read by Professor Lindsley, of New Haven. It very forcibly discussed "the overshadowing of our homes" in towns and villages by shade-trees. The following represents some of the salient points in the paper:

The sanitary surroundings of our homes, where our families live and are reared, ought to be as nearly perfect as it is possible to make them.

The grounds should be well graded, drained, and free from stagnant water, and sufficiently dry and wholesome, and trees and bushes should be well thinned out, lest they be the means of preventing the free access of sunlight, without abundance of which no family can be either truly healthy or happy. Every bed chamber must, if possible, be so situated that abundance of sunlight can enter it for some hours daily — in clear weather — and especially is this true of the nursery, where the greatest amount of sunshine is needed, and where its life and health giving rays will most surely make its value recognized in cheerful dispositions and in healthy bodies.

When a man begins to take special precautions as to his diet and exercise, having in view rather his future health than his present comfort or tastes, he has in most cases already begun to suffer from the effects of his imprudence, and does not commence a hygienic course of life as a perfectly sound and healthy person. The same is true for a community. It will not usually submit to the burden of taxation necessary to secure needed reforms until the neglect of these things has resulted in such an amount of disease and death as to forcibly call attention to the matter. The result is that the burden is far heavier than it would have been had the work been undertaken in proper season.

"When a State or municipality has so far advanced in civilization as to consider it desirable to take measures to protect the public health by preventing individuals from polluting the air or water liable to be used by their neighbors, the services of the medical profession are usually called upon." — [Pepper's System of Medicine.]

This subject is one of national importance, and concerns not only the prosperity of the people in a pecuniary sense, but is of greater importance in relation to sanitary matters and the general protection of health. Concerning the preservation of our forests, it would be difficult to write too much, and everywhere there should be a desire to preserve and protect them. We are witnesses this year of the terrible calamities resulting from the wholesale destruction of our forests, but perhaps we do not sufficiently consider that the general climate suffers from this cause, and that indirectly much of disease and death results from the wanton destruction of the trees, so essential in the general condition of healthful landscape. It has been hoped that the government would make some practical efforts to protect the forests.

For many years our people have given considerable attention to this subject of forest culture, but instead of exercising their influence in the direction of forest protection and increase where it is most needed, many seem to content themselves with planning "arbor days" and employing our school children in planting trees and shrubs in parks and school grounds and streets of our cities and towns. To witness the faithful efforts of our children as they plant the trees where sunlight is most needed, one cannot help feeling that oftentimes these efforts are sadly misdirected and the theory taught is not the true one. This love for the beauty of foliage is right and it is natural, and properly guided is to be encouraged, but it has undoubtedly been only too often extravagantly bestowed, and the societies formed for this purpose are not always under

the direction of the wisest, and the planting from a sanitary point of view has not yet received much attention. To set out as many trees as possible seems to be the object, and this is limited only by the means and the amount of land at their disposal. The poem of "Woodman, Spare that Tree" has won a strong place in the hearts of the people, and while whole forests disappear as if by magic, in ruthless waste and in serious menace of health and life, the tree in the town whose roots are bathed in poisonous soil, and whose branches are filled with deadly vapors, and whose leaves repel God's glorious sunshine, stands triumphantly, a delusive ornament and a dangerous menace. So much has this natural love for the beauty of foliage been misdirected that many sicken and die from overshading — even as many must also suffer from the wanton destruction of our forests. Overshading is a serious fault and directly lessens the value of real estate, and noticeably increases disease and shortens life. These facts should receive careful and positive attention.

Vegetation produces a great effect upon the movement of the air. Its velocity is checked, and sometimes in thick clusters of trees or underwood the air is almost stagnant. If moist and decaying vegetation be a coincident condition of such stagnation, the most fatal forms of malarious diseases are produced. A moist soil is cold and is generally believed to predispose to rheumatism, catarrh, and neuralgia. It is a matter of general experience that most persons feel healthier on a dry soil. In some way which is not clear, a moist soil produces an unfavorable effect upon the lungs. A moist soil influences greatly the development of the agent, whatever it may be, which causes the paroxysmal fevers. In ground which has been rendered drier by drainage, Buchanon has shown that there has been a diminution in deaths from phthisis.

As man pales, sickens, and dies without the blessing of the sunshine, so, too, the earth deteriorates and becomes unfit as a safe resting place for man, if it is deprived of the requirements of nature. It frequently happens that physicians are called to prescribe for ailing people who seem to possess every comfort and luxury, and yet who are really perishing because their houses and grounds are overshaded.

These people who live in such houses are always cold and miserable, needing extra clothing and expending great quantities of fuel in order to obtain the needed warmth and to dispel the deadly chill. Artificial heat can never be compared reasonably with the pure, life-giving sunshine, and human science can never discover a substitute for the divine light of health and life.

Where houses are overshaded the nervous system also suffers as well as the general bodily health; mental disturbance, melancholy, and madness are to be apprehended from such dreary surroundings.

Every intelligent man who loves his family, and recognizes his duties as the responsible head of a household, must occasionally ask himself whether or not the house he is occupying is safe for those he loves better than himself. All should be keenly alive to the importance of proper sanitary surroundings, and nothing should be neglected and no vigilance spared to make the homes as secure against disease as against the intrusion of burglars.

A happy, healthy home, with God's glorious sunshine within and without, and the sunlight of children's smiles at the fireside, is a reward for our vigilance and duty worthy of our most constant devotion.

Dr. James F. Hibberd, of Richmond, Ind., read a paper on "Clothing in its Relations to Hygiene." This was an excellent paper, and the writer concluded in the following language:

In submitting this dissertation there is no pretense of having demonstrated a theorem, but simply announced an opinion, its true intent being to call attention to what are conceived to be wrong views of clothing in its relations to hygiene, leading to dangerous practices in dress by a large fraction of the population in this latitude. This opinion is not the result of theorizing, but has been pressed upon me by having to deal with the consequences of errors in this behalf fallen into through mistaken ideas regarding the true role of the skin in the human animal economy.

It seems time that the relation of clothing to the health of the people of temperate climates engaged in civil industries should be reviewed, and the points for investigation may be summarized thus, viz.:

1. The popular and professional estimate of the hygiene of the skin is much below its real importance.

2. The physiology of the skin cannot be largely interfered with without endangering the general health.

3. One of the most influential factors in the sound health of man is to establish and maintain in his organization a resisting power to the causes of disease.

4. The tendency is to overdress, enervating the skin and curtailing its power, and thereby the power of the whole system, to resist the causes of disease.

5. A proper exposure of the surface of the body to environing low temperature is a valuable general tonic.

6. Ventilation of the skin is indispensable to good health.

7. Habit may enable one to bear wide differences in clothing under similar surroundings without detriment, and this should impress the necessity of cultivating correct habits of dress.

EVENING SESSION.

The formal welcome given to the association in the Academy of Music was in every respect a brilliant affair. The stage and boxes were handsomely adorned with palms and potted plants and flowers, handsome invitation programs had been provided, and Post's Twenty-third Regiment Band furnished excellent music during the evening.

Dr. Raymond, who presided, delivered the introductory address, in which, after welcoming the American Public Health

Association, he said that it was composed of six hundred members, representing every State and Territory in the Union and every province of Canada. Among them were physicians of both sexes and of every school of medicine; men and women who had at heart the welfare of mankind, and were striving to disseminate knowledge with a view to preserve health and lengthen life. The history of civilization contained no brighter page than that which recorded the deeds of bravery of many of the members of the association, their self-sacrifice and devotion to their fellowmen. In the epidemics of pestilential diseases these men had been appealed to by the fever-stricken, and had never appealed in vain. While others had fled to escape contagion, these men had remained. It is due largely to the labors of these men that almost every community in this broad land enjoys to-day a sense of immunity from pestilential disease. In conclusion, the Doctor introduced Mayor Chapin, who, in welcoming the association, spoke in part as follows:

The different duties assigned during this session are none of them distasteful to those who have assumed them, but my duties seem to give me an advantage over those who are to follow me. This association must be well aware that it is welcome in Brooklyn, and it does not matter so much if I fail to fully welcome you, for another gentleman is to follow me who will make up for my shortcomings. You have doubtless been told at the various places where you have previously met that it was fitting you should have chosen those places. Now there are also reasons why it is well you should meet here. Brooklyn stands among the more healthful cities. The population of Brooklyn may have been carefully sifted out and selected from the other cities of the earth. If the health of the city of Brooklyn is due to the virtue and hardy constitution of our ancestors, we may be an interesting study to your association. I have given some study to posterity. When I first came to the position which I now occupy it seemed to me my duty to make certain suggestions which would fall due about the time the next generation was ready to receive them. It is to be anticipated that the results of your labors will be to render posterity hardier and healthier and better.

You are a body of scientific men. Your work, although it is broad, and deserves all in eulogy that may be said of it, does not cover the whole ground. Your profession illustrates the truth that as the whole community has grown, so each part requires a greater and closer attention. It becomes necessary for the specialist to devote his work to the perfection of the whole of which it forms a part. There is an analogy between this and the fact that the science and principles of government are broadening, and at the same time becoming more intricate and elaborate. The problem of politics of modern times is illustrated

by this analogy, — that the power of government proceeds from the individuals and to the community. Your body, to some extent, is a political body, and it comes to pass that when you look back you see a weight of laws and enactments based upon your investigations and recommendations; and I would especially thank you for your political work, as I have indicated, and from which Brooklyn has reaped her share of advantage.

After a selection had been rendered by the orchestra, Dr. Raymond introduced Dr. Alexander Hutchins, who, after an ornate introduction, spoke at some length upon the advancement of the science of medicine, of its past, its present, and its future. He also devoted a portion of his remarks to the American Public Health Association, paying a glowing tribute to its history and prophesying for it a glorious future of usefulness and progress.

Dr. Hosmer A. Johnson, of Chicago, the president of the association, was the next speaker. He expressed his appreciation of Brooklyn's hospitality, and then gave his attention to the consideration of the object of the association:

It is desirable to impress the general public with the fact that public health is public wealth. The world has never realized to its fullest extent what it might accomplish, and men should endeavor to accomplish all that is possible. A difficulty in the way of sanitary science has been that we do not know exactly the cause of our sufferings, and the skepticism of the public. The plague is a specter of the past, and small-pox is a Samson shorn, and this is largely the result of increase in sanitary knowledge. Within the past century great additions to knowledge of the causes of disease have been made, and a consequent advancement in the beneficial results of medical science. In the speaker's boyhood a death from typhoid fever meant a mysterious dispensation of Providence; it now means foul water, bad food, violations of sanitary law. The diffusion of scientific knowledge is constantly increasing, and we now have primers and handbooks of useful scientific knowledge. Science is now being investigated as to its relation to the social and political welfare of humanity. Men are becoming more and more susceptible to sanitary notions. The great problem before sanitary investigators is the protection of the great public.

There is an obligation to protect the health of the citizen as well as his property. Our legislation to this end has been framed in the presence of danger, has grown out of epidemics. But sanitary laws must be based upon the knowledge and approval of the people, and it is necessary to interest and instruct the public, and that is one great object of the association. But the matter must enlist others besides the men of the medical profession. Sanitary engineers and others must help in the work. Another duty is to prevent the introduction of disease from without. There should be in every town and city and hamlet a health officer or officers, whose duties in the preservation of health should

be scrupulously performed, and ample statistics should be secured and preserved. The time is not far distant when a health officer will be recognized as just as much a necessity as a constable or a justice of the peace. Knowledge should be disseminated, consultation should be had, and the widest and most minute exchange of sanitary facts and statistics should obtain. A national sanitary authority is greatly needed, with adequate power and means. More money and care should be given to the care and preservation of human life.

The Rev. Dr. Storrs was next introduced and spoke in substance as follows:

I am glad to add my word of welcome to this association. Health and holiness, as words, come from very much the same root, and both mean very much the same thing; that is, wholeness. Physicians and ministers should regard each other as brothers, and work together, and they generally do. I remember no face so well as that of the most capable, most affectionate and efficient Dr. Chauncey M. Mitchell. Character, the power of impressing his patients, is an important qualification for the physician. Many years ago there was an alleged distinction between the American and English mind and the French or German. The former were regarded as being the more rapid in their operation, while the latter were considered the more searching and minute in their investigations. But from the fact that by the use of the microscope our physicians can now count the ten thousand millions of microbes said to be contained in a given square inch, and give a name to this, that, and the other of them, it would appear that the American mind has acquired that quality of minuteness in research in which it was held to be deficient. The American scientific mind has become solar instead of lunar, giving light itself instead of simply reflecting it.

SECOND DAY. — MORNING SESSION.

Dr. Jerome Walker, of Brooklyn, read an interesting essay on "The Causes and Prevention of Infant Mortality," in which he said:

Parents in general are better acquainted with sanitary measures than was the case even fifteen years ago, but there is much that is published in newspapers and magazines under the head of hygiene that is unreliable and productive of harm. Reliable information should be furnished in all schools by competent physicians, and much of what is there taught will be repeated by the pupils to their parents, and so the good seed will grow and develop.

Health primers and treatises of any considerable size do not find their way into most homes. Cities might, to advantage, spend considerable money to enable boards of health or sanitary associations to gratuitously distribute, where most needed, sanitary tracts. Directions as to disinfection might well be given by physicians to families needing them. Health inspectors, if the right sort of men, can do much by personal information.

Boards of health can and should see to it that the drinking-water is ample and good, that milk is at least quite pure, and not furnished by cows fed on sour garbage or distillery slops and kept in unhealthful stables at house garbage is promptly removed; that plumbing is as it should be; that the sewers are properly flushed and disinfected; that contagious diseases are studied, and their spread prevented as far as possible by isolation and notification to the people; that houses are not overcrowded, and that every facility is afforded for the building of model tenements. The hard working, conscientious health officer has a wonderful opportunity to save life and increase the comfort and usefulness of the people.

We may conclude from what is known of institutions for children:

1. That a large proportion of the deaths in them are preventable.

2. That the younger the children and the larger the number the greater the mortality.

3. That the mortality can be lessened, but the decrease costs money, time, patience, and energy, and to obtain the best results the attending and resident physicians should be reliable, should be given control over all medical and sanitary matters, and should be held responsible for the same.

A paper on the "Relations of the Dwellings of the Poor to Infant Mortality," by Alfred E. White, C. E., of Brooklyn, was upon a kindred subject, and was a faithful representation of the conditions that obtained among the poor in New York and Brooklyn, as well as other large cities, and he showed by careful statistics the change for the better that had been brought about by substituting the modern tenement house for that formerly in use in those cities.

Papers were read by Dr. Homan, of St. Louis, upon "The Compensation of Local Boards of Health," and by Dr. W. M. Smith, health officer of the port of New York, on "Quarantine." This was illustrated with maps and drawings, and afterwards the association was invited to inspect the work of the health officer, and an excursion was arranged and carried out in a very agreeable manner.

The afternoon session was omitted in order that the members might attend Dr. Smith's reception and the excursion.

EVENING SESSION.

Edward Atkinson, LL. D., of Boston, Mass., read a paper on the art of cooking, and demonstrated how food can be cooked thoroughly and cheap. With two large oil stoves he prepared a culinary feast to which all present were invited. Meats, fish,

vegetables, bread, puddings, cakes, and several delicacies were cooked elegantly in the presence of the meeting and passed around.

The following is the paper read, in part:

The cost of materials which are used for food comes to one half or more of the average income of at least 90 per cent of the people of this country; yet our product of food material is more abundant in ratio to population than that of any other country which holds a prominent position in the civilized world. This food consists in greatest measure of grain, meat, dairy products, and roots or tubers; in small part of fish, green vegetables, and fruit. The greater part of this food must be converted into a digestible and appetizing form by the application of heat to it at the right temperature, the degree varying with different kinds of food; this heat must be applied for a suitable time, also varying with the kind of material which is to be converted into a nutritious form by its action. Yet there are no popular treatises or definite instructions on the scientific application of heat to food.

Good health depends in greater measure upon adequate nutrition and upon the conversion of food material into a digestible form than upon any other factor in life. A well-nourished man can bear adverse conditions of life in the dwelling-house, the factory, the mine, and the furnace, to which the ill-nourished man will succumb in a very short time. On the other hand, the capacity of the man to perform his work is as fully dependent upon the quality and adequacy of his food as the capacity of the horse, ox, or mule. The force of the man depends on his food as much as the force of the engine upon the fuel used under the boiler; this is almost as true as to mental as it is to physical power.

I venture now to give some of the general conclusions which I have reached by the application of somewhat crude methods and inventions on which I have experimented personally in such scraps of time as I could spare from my regular occupation, and on nearly two years' use of my apparatus in my own family.

I will challenge attention and discussion by first submitting some very positive and dogmatic statements, subsequently sustaining them by such proofs as I have to offer:

1. Special apparatus for boiling and frying has been adequately and suitably developed for the use of those who can afford these somewhat wasteful methods of preparing food, yet excellent when skillfully practiced.

2. The ordinary methods of frying are utterly bad and wasteful.

3. Bread may be baked suitably in a brick oven, and also economically, when the work is done upon a large scale.

4. It is very difficult to bake bread in a suitable way in the common iron stove or range; for this, among other reasons, most of the bread consumed in this country is very bad, although we have the greatest abundance of the best material.

5. Meats may be well roasted in a costly manner before an open fire.

6. Aside from the exceptional apparatus or methods named, substantially all the modern cooking stoves and ranges are wasteful and more or less unsuitable for use. All the ordinary methods of quick baking, roasting, and boiling, are bad; and, finally, almost the whole of the coal or oil used in cooking is wasted.

7. The smell of cooking in the ordinary way gives evidence of the waste of flavor as well as a waste of nutritious properties, and in most cases the unpleasant smell also gives evidence that the food is being converted into an unwholesome condition, conducive to indigestion and dyspepsia.

8. Nine tenths of the time devoted to watching the process of cooking is wasted; and the heat and discomfort of the room in which the cooking is done are evidence of worse than waste.

9. The warming of the room or house with the apparatus used for cooking is inconsistent with the best method of cooking, and might be compassed at much less cost if the process of cooking were separated from the process of warming the room or dwelling.

10. No fuel which cannot be wholly consumed is fit to use in the process of cooking, and any chimney which creates a draught upon the fuel when in the process of combustion, like the ordinary chimney of a house, is worse than useless, since it wastes the greater part of the heat generated from the fuel.

The true science of cooking consists in the regulated and controlled application of heat, by which flavors are developed and the work of conversion is accomplished. For this purpose a quantity of fuel is required which is almost absurdly small compared to the quantity commonly used.

Portions of oatmeal and other cereals, custard pudding, hash, etc., that were cooked in the hall, were placed on plates and spread upon the platform, and after the address the audience was invited to come forward and try them.

MORNING SESSION, OCTOBER 24.

The following papers were read and discussed:

"Recent Researches relating to the Etiology of Yellow Fever" (illustrated with the stereopticon), by George M. Sternberg, M. D., major and surgeon United States Army, Baltimore, Md.

"Preliminary Observations on the Micro-Organism of Texas Fever," by Dr. Theobald Smith, of Washington, D. C.

"Some General Observations on Texas Fever" (illustrated with the stereopticon), by D. E. Salmon, D. V. M., chief of the Bureau of Animal Industry, Washington, D. C.

Dr. Martin, of Milwaukee, read a paper on the "Disposal

of Garbage." This was an interesting paper, and the writer evidently had found occasion to study the subject. He closed his paper by saying:

Of all the questions that have arisen in the sanitary work connected with the city of Milwaukee during my eight years of service, none has given more trouble and annoyance than this question, that like a nightmare haunts the health officer: How best to dispose of our garbage?

Dr. S. S. Kilvington, health officer of the city of Minneapolis, read a paper on "Statistics on River Pollution, with Observations relating to the Destruction of Garbage and Refuse Matters." Dr. Kilvington said, in part:

In the majority of cities the problem of the disposal of garbage is practically unsolved. A circular letter was sent to the health officers of 175 cities in the United States, and replies were returned by only sixty-six. Less than one third of these showed the possession of any statistics regarding the quantity of waste materials disposed of per annum. A surprising indifference to the subject is shown in many directions. Health officials in cities of 100,000 to 500,000 inhabitants "have not thought about it," or "have no opinion on the subject," or "have had no experience and entertain no views." We can no longer leave to nature the chemistry of our waste products without danger to ourselves. The prevention of pollution of water courses by the deposit therein of waste material is undesirable at best, and intolerable where rivers or lakes are used as sources of water-supply. In the Mississippi river during the past year, eight cities alone deposited 152,675 tons of garbage and offal, 108,250 tons of night soil, and 3,765 dead animals. In the Ohio river, five cities in the same period dumped 46,700 tons of garbage, 21,157 tons of night soil, and 5,100 dead animals. In the Missouri river, four cities cast 36,000 tons of garbage, 22,400 tons of night soil, and 31,600 dead animals. It should be remembered that many of these animals were killed because suffering from contagious and loathsome diseases. No theory of self-purification of running water will dwarf the magnitude of the sanitary crime. Two methods commend themselves to the careful student of this matter: the rapid decomposition of these waste products with a view to converting them into profitable forms of fertilizer and machine oil, and the rapid and complete combustion of these materials with a view to their entire destruction. The former is the more economical method, and animal manure may be conveyed a short distance from a city. As a rule, however, the agricultural interests demand soiling material in a concentrated form. Rendering-works have attempted to produce such fertilizer, but do so in a clumsy way. A scientific piece of apparatus known as the Merz system is in operation in three or four large cities. It treats only garbage, however, and necessitates the separation of such from other waste materials. The question remains, what disposal is to be made of dead animals, night soil, and sewage, which must

soon be forbidden deposit in our water courses, and which has an even more noxious quality and an even higher fertilizing value than the garbage with which the Merz system proposes to deal. The crematory has proved a practical success in many places. Out of thirty-five health officers who have favored me with a reply to my request for an expression of an opinion upon the disposal of garbage, twenty-three indorse the practice of cremation.

Many other valuable and instructive papers were read and discussed.

The following officers were elected for the ensuing year:

President — Dr. H. B. Baker, Lansing, Mich.

First Vice-President — Dr. F. Montizambert, Quebec.

Second Vice-President — Dr. Joseph H. Raymond, Brooklyn, N. Y.

Secretary — Dr. Irving A. Watson, Concord, N. H.

Treasurer — Dr. J. Berrien Lindsley, Nashville, Tenn.

The association adjourned to meet at Charleston, S. C., December 16–19, 1890.

SEWER-GAS POISONING.

BY JOHN J. BERRY, M. D., MEMBER OF THE STATE BOARD OF HEALTH, PORTSMOUTH, N. H.

There has long been a settled conviction that many of our infectious diseases, as well as other and more chronic affections, are produced by the absorption of poisonous gases. Just how often and to what degree the latter may act as causative factors has not been accurately determined, neither are we fully cognizant of the peculiar conditions under which a poisonous atmosphere may produce its most fatal results.

In the consideration of the subject many erroneous ideas have been entertained by the laity and indorsed by the profession. As a result, many who are living in fancied security are being constantly subjected to its influences. Yet so vague and indefinite may be the symptoms, and so protean the manifestations, that the most skilled and experienced practitioner may be justly pardoned if, in certain instances, he fails to appreciate the conditions at fault.

The reader naturally asks, "What is sewer-gas?" It should be understood that the word "sewer-gas" is a general and comprehensive term for a great many toxic conditions, which in turn are produced in many different ways. These phenomena are well explained by Nichols, who, after extended observation and experiment, writes as follows:

"When a mixture of organic matter of vegetable and animal origin, such for instance as that which comprises ordinary sewage, is allowed to stand, it begins to undergo chemical change, and there are formed, partly by action of atmospheric oxygen,

and partly by changes taking place within the mass, a great variety of compounds of greater or less complexity, and differing in character and relative amount according to the circumstances under which the decaying matter is placed. Some of the compounds thus formed are gaseous, and escape into the surrounding atmosphere. If there is a free circulation of air about the decaying substance, the gaseous products of decomposition may be diluted to such an extent that we cannot appreciate, even by chemical analysis, variations from the normal condition due either to the loss of oxygen used up in the process of decay or to the addition of foreign ingredients. If, however, the decomposing mass is so situated as to only partly fill a receptacle which contains in addition a limited amount of air, and to which fresh air does not have free access, then a large proportion of the oxygen of the confined air disappears, and the space above becomes filled with the gases which have been produced as the result of decay, in addition to what nitrogen of the air remains. In ordinary cesspools and vaults, and in ill-constructed sewers, there is always some access of air, and the gaseous products of decomposition become more or less diluted, so that, although the air in the sewer may seem very foul, the deviation from the normal air, when expressed in figures, is ordinarily quite small."

It will thus be seen that both the amount and the composition of these gases are dependent upon atmospheric and other conditions which are not always appreciable. In few instances are we able to name accurately the products of such decomposition or to forecast their toxic effects. The air of sewers may be stated to contain ordinarily, and in varying proportions, carbonic oxide, marsh-gas, and other compounds of carbon and hydrogen, sulphuretted hydrogen, sulphide of ammonia, various forms of bacteria, and many volatile substances. While all these may be present at the same time, it is only in rare instances that they exist in sufficient quantities in any sewer to produce immediate effects. For example, carbonic dioxide seldom exists in a proportion greater than one or two per cent, carburetted hydrogen or marsh-gas in a much less amount, while sulphuretted hydrogen, in order to be positively noxious, must exist in sufficient quantity to produce a very decided odor. It is a significant fact that, with the exception of the latter, none of these gases, when

artificially produced and moderately diluted, are capable of producing any untoward symptoms.

Letheby, as the result of his examinations of the air of the London sewers, gives its composition as follows:

Oxygen	19.51
Nitrogen	79.98
Carbon dioxide	0.53
Marsh-gas, Ammonia, Sulphuretted hydrogen	traces

A similar analysis of the air of one of the Boston sewers, by Nichols, gives the following maximum percentages:

Oxygen	20.90
Nitrogen	79.26
Carbon dioxide	.50
Sulphuretted hydrogen	traces

No estimates could be readily made of the amount of volatile and other matters which were undoubtedly present in both instances. These are fair examples, however, of the composition of ordinary sewer-air.

In most instances of acute poisoning, the symptoms are produced, not by the presence of any of these gases, but by a deficiency in the supply of oxygen, a condition which is characteristic of the atmosphere of such localities. There are, however, other and far more important phases of the sewer-gas question which must be considered.

The sewage of dwellings not only produces, through the processes of decomposition, foul air, but it supplies the vehicle by which the various infectious diseases are propagated. The fact has been well established that many, if not all, such affections, are the outcome of specific germs which are thrown off in the excretions of those diseased, and which, under proper conditions, are capable of reproduction. These particles are appreciable only under the highest magnifying powers, and give to the senses no other indication of their presence. Sewer-air, therefore, which, so far as its gases are concerned, may be quite inoccuous and unrecognizable, may, through the presence of these germs, possess qualities of the most deadly nature. Hence modern investigators are inclined to attribute greater dangers to the germ-laden

atmosphere than to the poisonous gases of sewers. In this connection, Waring tritely remarks: "Foul odors are a warning to our senses, perhaps nothing more. The morbific influence, when it exists, may accompany these odors, but it is not of them.

There is reason to believe that these specific germs of disease may be derived not only from the sick person himself, but may also be developed *de novo* through the agency of the various bacteria, which begin and carry on the putrefactive processes. In diphtheria, for example, this theory seems almost susceptible of proof. The same may be true of some of the other contagious and infectious diseases, for when the system of sewerage is imperfect and waste matter is allowed to collect along the line of pipes and drains, the necessary conditions for the development and growth of these germs are fulfilled, and we have not only the gases but the living organisms, possessing a great diversity of form and action and ready to exercise their baneful influence whenever an opportunity presents itself.

Simon, in his article on "Filth Diseases," says:

"The ferments, so far as we know them, show no power of diffusion in dry air, but as moisture is their normal medium, currents of humid air (as from sewers and drains) can doubtless lift them in their full effectiveness, and if into houses or confined exterior places, then with their chief chances of remaining effective."

It thus follows that the conditions especially favoring the development of these agents are drains and sewers which are improperly laid, which have but a slight grade, which are imperfectly flushed, and to which little or no air is admitted. Under such circumstances we may safely state that no trap or other appliance will properly protect the dwelling, — no water-seal will effectively guard the entrance to the sewer. The upward pressure and the great diffusive power of these gases will, of course, be influenced by many different conditions, but there is abundant evidence to show that such air, together with living organisms, has been forced through well-constructed traps, and the latter, having adhered to the glass slide, have been demonstrated by the microscope. It is not always the main sewer which is at fault, for the various morbific agents may be generated in consid-

erable quantities in the soil-pipes, waste-pipes, and drain, and, provided no traps intervene, are almost certain to produce unpleasant results.

One of the most frequent sources of poisoning is the cesspool, which is particularly common in country and suburban dwellings. These devices are, as a rule, large in size, with air-tight walls and no ventilation; in short, their construction is such that every condition favorable to the prompt development of disease germs, such as heat, moisture, the admixture of various forms of organic and inorganic matter, and the exclusion of oxygen, are freely offered. The consequence is that in default of other exit these agents follow the direction of the least resistance, rise through the waste-pipe, filter through the water-seal, if there happen to be one, and enter the dwelling beyond. Traps are of inestimable value for the purposes they are intended to serve, yet they should not be relied upon as efficient safeguards in cases where all other sanitary precautions have been neglected.

It having been shown how sewer-air may enter the dwelling, it remains to consider some of the results produced by the same. While many cases of such poisoning present definite and unequivocal symptoms, there are likewise many, and perhaps a majority, in which the nature of the trouble can be determined only with the greatest difficulty. There may be presented many and varied phenomena, none of which are characteristic of any one particular disease. Hun, in a recent analysis of twenty-nine cases of undoubted sewer-gas poisoning, noted the following symptoms:

1. Vomiting and purging; 2. A form of nephritis; 3. General debility; 4. Fever with chills; 5. Sore throat; 6. Neuralgia; 7. Zymotic diseases; 8. Asphyxia; 9. Puerperal fever; 10. Abscesses; 11. Lymphadenitis.

The intimate relations existing between sewer-air and various low forms of fever have been frequently noted. These conditions have no special characteristics; there may be, and often is, much digestive disturbance, such as nausea, loss of appetite, and looseness of the bowels. The fever, however, has no typical course and no fixed limits. Whether these phenomena are to be attributed to the action of the gaseous bodies, or to the germs

therein contained, cannot at present be determined. No difficulty, however, has been experienced in tracing typhoid, scarlet fever, and similar diseases to sewer emanations. Loomis writes of a "sewer-gas pneumonia," which often occurs in New York city, and a similar form has been noted by Bell and by many English authorities. Parkes, in his monumental work on hygiene, says: "The air of sewers passing into houses aggravates most decidedly the severity of all exanthemata, erysipelas, hospital gangrene, and puerperal fever, and it probably has an injurious effect upon all diseases. Two special diseases have been supposed to arise from the air of sewers and fecal emanations, viz., diarrhea and typhoid fever." Not only may they be derived directly from this source, but from milk and other liquids which have been exposed to a contaminated atmosphere and have absorbed germs and other noxious particles.

Many affections of the throat can be properly ascribed to the same causes. That form known as follicular tonsilitis has been repeatedly traced by us to a vitiated atmosphere, produced in many, if not most, instances, by foul waste-pipes and the opening of house drains. In these cases there was no admixture of sewage proper, all the circumstances going to show that a specific disease of a more or less contagious nature was produced *de novo* during the processes of fermentation in these localities. In very many instances there was no history of undue exposure and no indications that the patients had taken cold, the symptoms having been undoubtedly produced solely by the breathing of a vitiated atmosphere. The same facts were noted, though somewhat less often, in cases of diphtheria. That able investigator, Sternberg, says: "It is extremely probable that the diphtheritic poison-germ is capable of increase, independently of the sick, in damp, foul places, such as sewers, damp cellars, and especially under old houses in which the floors come near the ground, leaving a damp, ill-ventilated space."

Jacobi and others, whose opinions are entitled to much respect, state that it may frequently be traced to sewer emanations, while the various epidemics in our larger cities have served but to confirm the statements of these observers.

Not less frequently is the practitioner called upon to prescribe

for a train of symptoms which are characteristic of no particular disease, yet which are of a chronic nature and not amenable to the ordinary forms of treatment. The manifestations perhaps most commonly noted are drowsiness, prostration, loss of appetite, headache, jaundiced hue of skin, nausea, colic, and irregular action of the bowels. Occasionally are noticed evidences of anæmia, emaciation, weak and irregular action of the heart, swelling of the limbs, functional disorders of the kidneys, and symptoms of nervous prostration. The signs of sewer-gas poisoning are oftentimes almost identical with those of chronic malarial intoxication.

The detection of sewer-gas is at times very difficult. While it may sometimes be recognized by the peculiar, musty smell which pervades a room which has been closed tightly for some hours, this is the exception, and more thorough tests are usually required to demonstrate its existence. The latter, however, are of a simple nature and can be applied by almost any one. The following chemical tests are employed for sulphuretted hydrogen: If a piece of filter-paper, moistened with a solution of acetate of lead, be exposed to an atmosphere containing this gas or sulphydrate of ammonia, its color is turned to a dark brown or black. Filter-paper dipped in a solution of nitro-prusside of sodium assumes a crimson, and turmeric paper a brown color with ammonia sulphydrate.

The "peppermint test" consists in pouring into the soil-pipe in the roof, or into the upper water-closet of the house, an ounce of the oil of peppermint, and following it with sufficient water to carry it through the entire length of the pipe, the latter being tightly closed at the top. An examination should then be made along its course from above downward. Should any defect exist in the pipes or traps, the pungent odor of the drug will be at once recognized.

The same test may be made with sulphuric ether, using a somewhat larger amount, but observing the same precautions.

Sulphur fumes may be utilized for the same purpose. They are applied by putting into an opening in the lowest part of the soil-pipe or drain an iron pan containing a few live coals, and throwing on one or two handfuls of sulphur, and closing up the

opening in the drain; likewise the one in the roof, if there be any.

In view of the great frequency of sewer-gas poisoning, the many instances of defective plumbing which exist, and the lack of interest and information possessed by a large proportion of the laity, a brief consideration of preventive measures seems to be demanded.

It is not our purpose to enter into the many details of plumbing, or to trespass in any way upon the field of the plumber or sanitary engineer, but rather to proffer a certain amount of information of a kind which should be supplied to every householder, whereby he may more effectually guard against the many dangers which threaten from these sources.

The chief and in fact the sole purpose of drainage is the prompt and complete removal of sewage, and the value and efficacy of any system are in proportion to the degree in which this object is accomplished.

No more comprehensive, and at the same time concise, rules can be given the general reader than those recommended by Gerhard. They are:

"1. Extension of all soil and drain pipes through and above the roof.

"2. Providing a fresh-air inlet in the drain at the foot of the soil and waste pipe system. (This with certain reservations).

"3. Trapping the main drain outside of the fresh-air inlet in order to entirely exclude the sewer-air from the house.

"4. Providing each fixture, as near as possible to it, with a suitable trap.

"5. Providing vent-pipes to such water-seal traps, under fixtures, as are liable to be emptied by syphonage."

Care should also be taken that the water-seal be preserved by constant use of the fixtures, and the traps and accessories be thoroughly cleansed from time to time by passing through them a hot solution of caustic soda, followed by a concentrated one of chloride of lime or bleaching powder.

A mere outline sketch, giving in brief the causes and results of sewer-gas poisoning, together with some rules for the detection of the same, may be of little interest to the scientific person who

realizes the vastness of the field and the many problems in physics, chemistry, engineering, and bacteriology which the subject suggests. The general reader, however, and the large majority who have given little or no attention to such matters may find in the practical review of the question some suggestive facts, as, for example, the frequency of filth diseases, their varied sources, and the ease with which they can be avoided. Preventive medicine has already accomplished much, but its greatest triumph will have been achieved when the public has been convinced that a large proportion of the diseases which afflict humanity arise from preventable causes.

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DANGERS FROM ADULTERATED FOODS AND POISONS.

BY PROF. E. R. ANGELL, DERRY, N. H.

"To be, or not to be; that is the question: —" not as Hamlet asked it, doubting "whether 'tis nobler in the mind to suffer," or, "his quietus make with a bare bodkin." Doubt mingled with restraint.

> "To sleep! perchance to dream; aye, there 's the rub;
> For in that sleep of death, what dreams may come,
> When we have shuffled off this mortal coil,
> Must give us pause. . . . .
> "The dread of something after death, —
> The undiscover'd country, from whose bourn
> No traveller returns, — puzzles the will;
> And makes us rather bear those ills we have,
> Than fly to others that we know not of."

Such is the would-be suicide. But the sanitarian believes that "to be" is better, and seeks to continue life, not so much from fear of what may be after death, as for the good that now is, — the ever-present good; seeks to avoid natural evil to secure natural good. While he believes in "the survival of the fittest," he also believes in the possibility of becoming fit to survive. If he believes that "the Lord giveth and taketh," he knows that the taking is too often done by another. He believes that death is natural, and, being so, is good; only when it comes untimely, is it an evil; and so he sees in death the image of sleep, as others see in sleep the image of death. A writer in the "Annals of Hygiene" expresses the truth well concerning the sleep of death:

"How few, we imagine, have ever moralized over this familiar

saying, yet how much suggestiveness there is about it. Look at one in deep sleep, when the movements of respiration are but feeble; is the resemblance to death not great? Is not a dreamless sleep as thoroughly full of oblivion to the sleeper as death can possibly be? So that, to both the sleeper and the beholder, is there not a close resemblance between sleep and death, the one a temporary slumber, the other an everlasting sleep? Dr. Oliver Wendell Holmes has truly said that 'Death to the aged man wears as pleasing a face as sleep does to one who is tired,' and we would add, that death to the young and ambitious man is as repellent in aspect as the most horrible of nightmares. The old man who has rounded out his measure of life regards death as the natural termination of his existence, and he quietly and willingly falls asleep; while the young man, who is by disease cut down before his time, can only regard the sleep that is thus forced upon him as an unnatural nightmare, a termination of that of which, he feels instinctively, he has not had a surfeit. Is it not wise, therefore, for all to so strive that death shall come to them as a welcome, expected slumber, rather than to be regarded as a horror too horrible to quietly contemplate?"

There is no nobler action among mortals than the prevention of untimely death. On the other hand, no human action is more deplorable in its results, or baser in its purpose, than that which shortens life. Every individual life has a value, not only to itself, but also to its neighbor; consequently, to the body politic and the country at large. "Public health is public wealth." For national prosperity the country must guard the health of its citizens with scrupulous care. The principle of "straining at a gnat and swallowing a camel" is too often illustrated in the management of the State. Large sums of money are often spent by the government for punishing some flagrant crime involving the life of one individual, while it allows a more polite evil to stalk abroad unmolested, starving the poor, defrauding the pocket, shortening the lives of thousands, — and this largely on the "penny wise and pound foolish" system, and partly because so many are honest no rogues are supposed to exist. Said the Hon. J. W. Green in a speech delivered in the Forty-eighth Congress: "Who will say that he who stamps and

passes off little bits of baser metal than the standard bullion, to put into your pockets, is guilty of greater wrong than he who prepares and sells to you base and counterfeit compounds, not to say deadly, to put into your stomachs? Possibly the reason for imposing penalties in the one case and neglecting to do so in the other is that our ancestors could not realize that human cupidity could prompt such depravity as trifling with the health, well-being, and very existence of myriads of their fellowmen."

One phase of the case was illustrated a few years ago in a New Hampshire town. The town warrant contained an article authorizing a vote upon the question of appointing a milk inspector. The measure was regarded as an insult. Just as if the integrity of the farmer was not above suspicion! and yet, in the same town, there are men who have added twenty per cent of water and more to milk which they furnished for the market. Here is the analysis of a recent sample of milk:

Specific gravity	1.018
Total solids, per cent	8.83
Fat, per cent	3.03
Solids not fat, per cent	5.80
Ash, per cent	0.43

This milk is below a standard of 12.50 per cent for total solids (not the legal standard 13), by an equivalent of 36 per cent of added water.

A sample of milk from another town gave the following results:

Specific gravity	1.019
Total solids, per cent	8.59
Fat, per cent	2.66
Solids not fat, per cent	5.93
Ash, per cent	0.48

This milk is below a standard of 12.50 by an equivalent of 35 per cent of added water.

While the integrity of citizens as a whole is above suspicion, it is not true of each individual; but the fallacy of arguing from the general to the special often prevails. It prevailed when a grand jury within the limits of New Hampshire failed to indict a man for watering milk, and in so failing not only licensed crime but offered contempt to law.

Every man is his brother's keeper to the extent that he should forbid him to do anything which he himself would neither do to another nor wish done to himself. Until the farmer who sells pure milk is willing that his neighbor, by selling watered milk, should live easier and get rich faster than himself; until he is willing to become a consumer only, and allow his neighbor to sell him watered milk, and not until then, will it be right to shield the defrauder. It will be right for no one who eats, takes medicines, or wears clothes, to stand in the way, either directly or indirectly, of suppressing the nefarious business of frauds until he is willing his neighbor should cheat him and poison him into the bargain.

The evils of watering milk and adulterating other foods do not stop with robbing the purchaser of money, but extend even to the murdering of himself and family.

Mr. H. Wharton Amerling, president of the American Society for the Prevention of Adulteration, said in an address:

"By adulteration man is made sick, and by it he is prevented a recovery and most foully murdered. Why, thus it is that paupers are made plenty, criminals many, lunatics numerous, and Americans known as a nation of invalids. Men are losing their mental powers, and with them their property and honor. Adulterations more than intemperance dement, delude, and madden to fraud, violence, and murder. Progeny inherits mental traits, and possesses an anomalous desire to do violence to other's property and person, to burn houses and wreck trains. More room for the insane is the general demand. Already fifty million dollars has been invested in asylums, while the cure of the insane costs annually fifteen million dollars. From 1870 to 1880 there was a gain of twenty-six per cent of the total population, while the insane population increased over one hundred per cent."

The opinion of various and competent authorities is voiced thus in reports of the Pennsylvania Board of Health:

"The adulterations of food and drugs are so numerous, so common, so universal, we might almost say, and at the same time so prejudicial to the health of our people, that constant watchfulness and omnipresent oversight alone can repress and prevent them." "The use of pure drugs and medicines, properly com-

pounded and administered, constitutes a most important feature for the preservation of health and the prevention of avoidable death. The harm arising from inert or impure drugs consists not only in defeating the end and object they are intended for, by admitting of the unchecked progress of the disease, and the fatal consequences thereof, but also in their improper and poisonous admixtures, which make them destructive to life and health. That there are annually a number of valuable lives sacrificed from this cause is as little to be doubted as that all the cases of suffering, illness, and death therefrom are certainly avoidable by proper knowledge, forethought, precaution, and legal supervision."

Dr. Stewart, of Jefferson Medical College, Philadelphia, in a pamphlet issued by the same board, entitled "A Clinical Analysis of Sixty-four Cases of Poisoning by Lead Chromate used as a Cake-dye," says: "There is no question, from recent developments, that the poisoning has been going on unsuspected in various sections of the city for years. Since my attention has been directed to the matter, I have been surprised in looking over the mortuary records of the past few months to see the large number of deaths returned as convulsions."

Dr. Beckwith, in a report on adulteration of food, drinks, and drugs, of the Ohio State Board of Health, says: "I appeal to mothers to protect their offspring from the ruthless hand of this destroyer. I appeal to the economist to enter the lists against this despoiler of our homes and depleter of our fortunes. I appeal to humanity to shake off the fetters of the most cruel tyrant and exacting despot the world has ever seen. I appeal to the commercial men all over the country to unite as a band of brothers and discountenance the adulteration of food and drink."

The late Hon. James Laird, of Nebraska, said in an able report in the Fiftieth Congress: "That one of the first considerations of every civilized government is its food supply, cannot be controverted, nor can it be contested that the purity of the supply is as important as the supply itself. Quantity alone will not meet the demand; quality, within certain limits, is as necessary to health and the prolongation of life as quantity is to its preservation."

The Hon. Mr. Green said, in the speech already referred to,

after calling attention to the alarming increase of nervous, cerebral, and kidney diseases, and of insanity being due to adulteration of drinks of all kinds: "Human depravity, with utter disregard of human life, has even dared invade the sacred precincts of the pharmacopœia, to lift the tops of the mystic jars on shelves arranged, and to infuse base substances in their portentous contents, where oft the difference of a feather's weight may involve the mortal life of immortal man."

While the large majority of adulterations are generally supposed to be quite indifferent or harmless in their action, we hope further on, from physiological considerations, to adduce grounds which, if not fully established, at least are in harmony with the views of the eminent authorities already quoted, and afford some reason for believing that all food adulterations are prejudicial to health, and that the greatest efforts should be made for the suppression of this kind of crime. The establishment of offices for the inspection of foods and drugs of course costs something; but is the cost to be compared with the loss sustained in the purchasing of adulterated articles? Dr. S. W. Abbott, secretary of the Massachusetts State Board of Health, in the sixth annual report says: "The principal articles liable to adulteration are milk, butter, spices, vinegar, cream of tartar, and various sorts of drugs. The value of these articles specified, at present consumed in the State, may be stated in round numbers at $15,000,000 annually. It may be safely stated that the enforcement of the statutes has resulted in a saving to the consumers of at least five per cent of this amount, or $750,000, a sum equal to seventy-five times the amount expended in the enforcement of the laws."

Efforts are made for the suppression of these iniquitous practices with the best results, but they are not sufficiently extensive to equal the needs. The national government and every state government should institute and maintain a most searching investigation of food products, and every individual should be educated to the importance of this until the government, through its citizens, is able to accomplish the work thoroughly.

A. J. Wedderburn, special agent of the United States Department of Agriculture, on the extent and character of food adulterations, in Bulletin No. 25, from which we have already made

valuable quotations, says: "Every article of food is to a greater or less extent the subject of adulteration. The people have no idea of the extent to which this damaging imposition is practiced; from the cheapest and most simple article of diet to the most expensive, the art of the manipulator has been applied. The inventive genius of the American has been exerted to increase the food supply, — undoubtedly a most laudable and praiseworthy undertaking; but when in so doing the manufacturer goes further, and in selling you pepper forgets to add to the words 'pure pepper' on the label, the words "compounded with burnt meal, mustard, cayenne, buckwheat hulls, pepper dust, etc.,' and also tries to obtain the price of a pure article, he degenerates into a common rogue."

Concerning the cost of adulteration, he says: "The total value of the food supply consumed in the United States, according to the 'American Grocer', is, at a low estimate, $4,500,000,000. The 'Grocer' estimates that two per cent of this is adulterated, or $90,000,000, of which ninety per cent is of a character nonprejudicial to health (this is exclusive of meats and milk). Accept for the sake of the argument this statement, and the result shows that there is $9,000,000 worth of poisonous food products put annually on the country, and $81,000,000 of fraudulent products. This immense sum of money is simply stolen from the people each year by men who win fortunes by cheating the consumers. That this estimate is far below the truth none can doubt for a moment, after an examination of the very able reports made in those States that have attempted to protect their citizens against this crime of adulteration. Take the very conservative estimate of Dr. Abbott, of Massachusetts, of a saving of five per cent to the people in the increased purity of food products (to say nothing of the benefit to health and morals). On $4,500,000,000 the annual saving to the country would be the immense sum of $225,000,000. There is undoubtedly a large part of the food products that never leaves the hand of the producer, and of course this is not adulterated; and again the wheat and corn production is rarely found adulterated in this country; besides which there are, of course, many articles manipulated and sold by honest men who would disdain to sell their goods if debased or

misbranded; yet in spite of all this, undoubtedly the percentage of adulteration, sophistication, and misbranding largely exceeds, in my opinion, five per cent of the whole, and I am confident that fifteen per cent would be much nearer the mark. Such an estimate would give the startling figures of loss to the people of this country alone of $675,000,000, a year."

But take the smaller figures. Think of the people of the United States buying annually $9,000,000 worth of poisonous food! But at what cost must the loss of labor during sickness caused by it be estimated? Or at what value shall the lives be set which it destroys?

The average man, born of healthy parentage, is born with potential longevity. Generally speaking, the possibility of health and of the full measure of years is in him. After the cessation of nourishment from maternal blood, what is taken into his system in the form of food constitutes the first and greatest requisite of all that he is and of all that he will be; it is the sustaining power and building material of future years.

The close relationship of the digestive and assimilative functions with the great circulatory system of the body, and the intimate mingling of food with the mystery of life, emphasize the importance of unadulterated articles of diet and of the absence of poisons. Poor food can no more make a good body and sound mind than a bitter fountain can produce sweet water.

The carbon, hydrogen, oxygen, nitrogen, sulphur, and other elements found in food compounds originally possess various properties of their own, but if left to themselves or acted upon by any purely physical force, as light, heat, or electricity, with the single exceptions, perhaps, of water and salt, not one compound useful to animal life is produced; but that something which we call plant life has power over them to combine them in new ways, as a skillful hand has power to draw from a musical instrument harmonies that it never sounded before. These proximate principles, as they are called, into which vegetable life has combined the elements of earth and air, constitute the food of animals. Plants stand between the mineral world and animal life. They clothe the mineral with a life which can be metamorphosed into animal life.

But with the predisposition of food compounds, imparted by an antecedent life, to become assimilable and transformable into animal tissue, the elements of these compounds still possess, though held in abeyance to another power for the time, their own inorganic affinity. This is ever ready to assert itself immediately the chain which binds them is broken. Hence, between the departure of one life and the approach of another, many an influence may obscure the guiding footsteps or unbridle the harnessed elements. Bacteria during incipient putrefaction may have cut the cord, and the changing elements set at naught the power of the organism to control them, in whose food they were once combined; or some foreign substance, at an unfortunate moment, may stand between the food principle and the life about to be fed, like a prison wall; or some antagonistic compound may destroy the food by converting it into another substance, or paralyze the life about to receive it.

Inorganic compounds react with organic compounds to destroy their character, e. g., the action of alum upon albumen or gluten, to coagulate and harden them. One compound formed by vital action may be antagonistic to another compound so formed, e. g., the vegetable and animal poisons.

Food is divided into small particles by the process of mastication, and then mixed with the digestive fluids for the sake of converting, separating, and saving the nutritious portions. The process is both chemical and physical. The completely digested food becomes a milky-looking fluid called chyle. It consists of fibrin, a large number of white corpuscles, and a small number of developing red corpuscles, many oil globules and fatty granules. It coagulates exactly like blood, and the clot after exposure to the air becomes pinkish, due to immature red corpuscles in it. Of course some of the nutritious elements of food enter the blood by absorption and diffusion through the walls of the alimentary canal and through the portal capillaries; but that portion which seems to receive the inspiration of life is in the chyle. The chyle is taken up from the small intestines by the lacteals, a part of the lymph-vascular system. They terminate in villi, which project from the mucous membrane of the small intestines. The lacteals from adjacent villi unite to form larger ducts, and

opposite the first lumbar vertebra they join the deep lymphatic vessels to form the thoracic duct, which is about as large as a crow's quill, and extending upward enters the left subclavian vein at its junction with the jugular vein.

The lymph-vascular system proper is a mysterious one. It begins with lymph capillaries, which "take their rise in the connective tissue of a part or organ and probably spring from spaces or juice canals between the bundles of the connective tissue." These juice canals form a network outside the blood vessels, which allow the tissues to be moistened by a nutrient or lubricating fluid derived from the blood. Along the course of the lymphatics are situated the lymphatic glands, bodies varying in size from a pea to an almond. The meshes of these glands are filled with lymph corpuscles which are washed out and carried into the blood by the stream of lymph which flows through them. With these corpuscles and with lymph itself chyle is intimately mingled before it enters the blood. Here, evidently, in the mingling of the chyle and lymph, is the beginning of blood and the beginning of life, the formation and vitalizing of protoplasm, that protean substance out of which the whole body is built through the agency of cells. Cells are the units of the body. "Protoplasm is a soft albuminous substance. In the midst of this delicate substance are nuclei or vesicles, which are germinal points. They divide and subdivide, causing division of the protoplasmic mass with them, thus forming new cells and building up the organism in whatever direction that may be." It is the plaster of the living body before it is set. It is building material which has received vital affinity in addition to the chemical affinity of its elements. There is in it an expression of incessant chemical and physical change, as a fountain expresses an incessant replacement of water. Dead food constantly goes up into protoplasm, and protoplasm continually goes down into cells; the former is called an anabolic, the latter a catabolic change, and the whole process is termed metabolism.

Protoplasmic cells have the power of spontaneous motion. White blood corpuscles have the same power of motion and contain protoplasm which is capable of existing in three states,— liquid, granules, and fibers. Doubtless the white blood corpuscle

is the progenitor of all the special building-cells of the body, which it accomplishes by becoming multinucleated and separated into parts. The following facts appear to add weight to the statement. White blood corpuscles are more numerous after eating; their ratio to the red blood corpuscles of the blood then is 1 to 300 or 400; but after fasting the ratio is not more than 1 to 800 or 1,000. They are very numerous when there is a wound to heal.

Food supplies building material; the white blood corpuscle varies with the amount of building material in the blood. The rational inference is that they constitute the transition state of food to tissue. They are numerous when there is a wound to heal, because the economy of the system retains them largely for making whole the wounded part before further additions are made to parts already perfect. Their excess at the wounded part often prevents the utilization of them all, so some are discharged as pus. The disease known as leukæmia, which is characterized by an excess of white blood corpuscles in the blood, is probably caused by a failure in the catabolic change of the protoplasm of the white blood corpuscle to differentiate special and individual cells of the various tissues; i. e., the white blood corpuscle, if it is the parent cell of such individual cells, loses the power to produce them or separate into them.

The origin of cells and corpuscles is past finding out, and the delicacy of their causes must be as great as their mystery is deep. After extended investigations, Prof. Richard Norris, of Queen's College, Birmingham, thinks that the corpuscles from the lymphatic glands, the splenic corpuscles, the thymus corpuscles, the thyroid corpuscles, and the corpuscles of the supra-renal capsules are alike, and are destined to become red blood discs after having passed through the stage of the colorless disc; while the white blood corpuscles, leukæmic corpuscles, and pus corpuscles represent certain deviations from this mode of development, are the accidents, as it were, of the great blood-making process; and that the white blood corpuscle, becoming multinuclear, ultimately disintegrates, producing colorless dics which gradually become red blood discs.

In providing so many blood glands, it would almost seem as if

nature declared that the production of blood corpuscles was not only most important but also most easily prevented. There being many glands, if one fails for any cause, others will act. Some proof of this might appear in the fact that a dog will continue to live after the spleen is removed.

But instead of introducing any chance work in the origin of white blood corpuscles, it would seem more consistent with the workings of nature, and at the same time afford better explanation for certain phenomena already mentioned, to suppose that either the blood glands produce both kinds of corpuscles, very much as children of both sexes are born of the same parent, or that the nutritious elements of the food, under the influence of digestion, produce the white corpuscles found in the chyle, which are receptive of life, from the colorless corpuscles of the lymphatics and other blood glands; the latter to become the fully developed red blood corpuscle, to perform its function in oxygenating the blood and then to die, its coloring matter being removed in the excretory products of the liver and kidneys; the former to become the white blood corpuscle, and from the differentiating vitality which it has received, to resolve itself into the various cell formations of the body. Whatever their origin, there is no doubt that the utility of the one is as definite as that of the other.

Metschnikoff advances the theory that the white blood corpuscles, or leucocytes as they are sometimes called, wage a warfare against disease germs, bacilli, and other things antagonistic to health. A recent writer says: "No good observer will fail to recognize the coincidence of the condition which diminishes the proportion of leucocytes and the increased liability to disease, — that of fasting; or note the no less remarkable coincidence, the diminution in the number of the leucocytes and increasing infirmity of old age. The leucocyte, or colorless (white) blood corpuscle, is an amœba, the simplest type of a living thing, a jelly-like mass of protoplasm, of the same consistency throughout, which possesses the property of moving about and capturing its prey by changing its form by the protrusion of first one part of its body and then another, and extemporizing a stomach by wrapping itself around any nutritive particle with which it comes

in contact. On account of this peculiar property and apparent function of the leucocytes, Metschnikoff has conferred upon them the name phagocytes, eaters."

Metschnikoff claims that in erysipelas he has observed the leucocytes attack and devour the micro-organisms of that disease; but whether the white blood corpuscle wages a general warfare against all disease germs is very doubtful. But because they are most numerous and powerful when the body is best able to resist disease, which condition seems to be dependent upon the ingestion of food, emphasizes the importance of proper nourishment.

Within the limits of the functions surveyed, if anywhere in the whole body, poisons and adulterations do their work. The delicacy of purely chemical action is marvelous. Doubtless influences which may affect vitality are still more subtile. One part of ammonia mixed with one hundred million parts of water betrays its presence to chemical reagents. The blood of a man weighs about one hundred thousand grains; therefore, if the reactions of vital chemistry were only equally delicate, it would require the introduction into the blood of but one thousandth part of a grain of a favorable or antagonistic substance to work a result.

The influx of nutriment through the assimilable functions is counterbalanced by a constant removal of worn-out material through the eliminative organs. Removal of what has become worthless is as important as the ingestion of food. So far as we know, the waste prodncts of all life are poisonous to the organisms which excrete them. The products of waste tissue, whether produced by fermentative change or retrograde metamorphosis, are basic substances, called leucomaines. We know very little about their formation, except that they are constantly formed in animal tissue side by side with urea and carbonic acid, and may be regarded as transition compounds of tissue in its way back to inorganic matter. Just as tissue cells are formed out of protoplasm by the appropriating action of animal life, so leucomaines are formed out of tissue cells by the discarding action of the same life. To get rid of them is essential.

Imperfect or impaired digestion is another internal source of poisons. Substances called proteids constitute a large part of

food and animal compounds. The first known step in the breaking up of the proteid molecule results in the formation of peptones. They are powerful poisons when injected directly into the blood, and a large quantity produces speedy death. In health, the peptones formed during digestion do not reach the blood, but are converted into globulin, a constituent of the red blood corpuscle, by the action of the liver. If too much food rich in proteids is eaten, and the digestion is active, more peptones are poured into the portal circulation than the liver can control; consequently some of them reach the blood and produce the weakness and languor often experienced by the well-fed and inactive after a meal. If the liver becomes torpid and fails to convert peptones into globulin, disastrous results of course follow. The condition called biliousness is doubtless due to the formation of poisonous substances from food through the inactivity of the digestive functions, especially of the liver.

Many nervous symptoms which accompany dyspepsia are due to the formation and absorption of poisons; the food is not wholly digested, but ferments under conditions favorable for the production of poisonous compounds. Carbon, hydrogen, nitrogen, and oxygen are common elements of the most violent poisons. Food contains all these elements; every time conditions are favorable, they will combine to produce such and such poisons. Poor digestion and a weak stomach leave the elements without control, and a wild interchange of compounds follows.

The ill effects of ordinary colds are caused, doubtless, by the retention in the system of effete products, leucomaines, which are ordinarily removed by the skin; this view appears reasonable because the best treatment for a cold is essentially eliminative. In some persons, and in the same persons at different times, there is a tendency to produce poisons out of certain foods. It is well known that eggs, or milk, or cheese, are highly poisonous to some. The retention of urea, together with other toxic principles of the urine, causes uræmic poisoning. Normal fæces contain a very poisonous substance, which may be separated by dialysis; injected into the blood of a rabbit, it causes violent convulsions. Dangers from constipation are evident. Vitiated air doubtless contains some leucomaine, to which its poisonous effect is due rather than to carbonic acid.

The conditions which render sleep necessary are, quite likely, not that tissue has been worn out and time must elapse for its replacement, but because the changes in it have resulted in the formation of poisons, which produce what may be termed a normal toxic effect, i. e., sleep, during which the eliminative functions "catch up" in removing them. If sleep is long delayed there is elevation of temperature and loss of appetite, in short, there is fever, fatigue fever, or fever of exhaustion. In persons of delicate organization, the loss of one night's sleep is sufficient to cause well-marked symptoms of this fever.

The disastrous consequences which follow the use of adulterated food, even of that which is generally supposed to be harmless, are now apparent. Adulterants irritate the delicate mucous membrane of the alimentary canal, and cause a flow of gastric juice altogether out of proportion to the amount of food to be digested. Thus there is an extra drain upon the system for which there is no equivalent return. The slight inflammation and exhaustion thus caused are two steps destructive to health. The stomach digestion is an acid one; the pancreatic digestion, which occurs in the duodenum, is an alkaline one. The presence of gastric juice is destructive to pancreatic digestion. Ordinarily the bile prevents this, but now the large excess of acids and pepsin prevents complete pancreatic digestion; fats are not emulsified and resolved; starch is not converted into sugar; proteids are not completely digested; peptones are not changed. Here are several results detrimental to health. Add to them the increased irritation of mucous surfaces by the undigested food. Peptones are not converted into globulin to build up the red corpuscles of the blood, but are allowed to enter that fluid directly, where they act as poisons, as we have already seen. Furthermore, poisons, produced in the undigested and fermented food, are absorbed into the blood to coagulate the normal proteids there and to interfere in some way with the metabolism of the white blood corpuscles and other protoplasmic cells. The physical forces are overtaxed in removing the excess of refuse in the alimentary canal, and whatever foreign substances have entered the circulatory system to poison it, or impede its functions, actually exhaust vitality through the increased labor of eliminating them.

The leucomaines proper, formed by the retrograde metamorphosis of tissue, are but slowly or partly removed. The low state of vitality induces constipation, followed by its attendant evils. The kidneys are less active, or actually inflamed; urea and kindred excretory products are retained in the blood. The action of the skin becomes deficient. The respiratory organs are enfeebled, and the leucomaines of respiration are retained. The very important function of the red blood corpuscles, that of carrying oxygen throughout the system, is impeded, both because they are deficient in number and shrivelled; consequently the body is in a state of general suffocation, and, oxygen being largely excluded, the conditions are more favorable for the formation of leucomaines and other poisons. The enfeebled body is an easy prey for disease; a cold is taken, the difficulty is augmented, and perhaps death ensues.

If the adulterant is an active poison, the ill consequences of course are augmented, and a fatal termination may be more certain and speedy.

To maintain healthy functions a sufficient quantity of pure water is necessary. Water is the universal solvent, and solution facilitates assimilation and elimination alike. If the blood does not contain its normal amount of water, it cannot hold in solution and distribute the building material where it is needed, neither can it dissolve and remove effete products.

Many mineral waters, though they may be valuable medicines, are no more suitable for continued use in health than is any other medicine. This is especially true of those which contain a large amount of mineral, or of those which contain even a little of some substance not naturally found in the human body. After they have cured the disease for which they may be a specific, their work is done; they have no action to ward off disease. On the other hand, the introduction during health of substances not entering into the constitution of the body tends to irritate, weaken, and poison it.

Adulterations also indirectly affect the public health and the public wealth to a vast extent. The laboring classes, especially the poorer paid, naturally are easily deceived by the lower price of poor and adulterated articles. Thus a demand is created for

such, and the seller, tempted by the great profit realized, is not slow to find a supply. The purchaser not only pays more for his annual supply of food, which deprives him of other comforts, but, being poorer fed, is less able to work and is more exposed to disease, both from the deficiency of nutrition and from the evil effects of adulterations already described. The individual does not get what he pays for. This is the most direct cause of making the poor poorer and the rich richer, an enemy that strikes directly at the foundation principle of the republic, that all men are born free and equal. Thus the country is jeopardized by the nefarious business of adulterating food. The prosperous State has healthy and prosperous citizens, because they are well fed and equally protected. Whether life amounts to anything, whether it is worth living, or whether the country would be better if its population were diminished or doubled, does not pertain to the question. The question is one of equality and justice to those who do live.

The indulgent parent allows the child to eat sweetmeats; they are adulterated, it may be, with poisonous substances. The child sickens. The sad and anxious labor of watching tells upon the health of the parent. Medicines and services of the physician draw heavily upon the often scanty purse; and all this misery because some are doing a wicked business.

But the most deadly if not the most general evil is the abuse of intoxicating drinks. This subject is not often treated under the head of sanitary reform, but alcohol is a poison, and when a voice is raised against poisons it must be included. Alcohol is antagonistic to all of the digestive fluids. It precipitates or destroys the active principle of saliva, gastric juice, and the pancreatic fluid. It coagulates the albuminoids in the alimentary canal and inflames its mucous lining. It is partly absorbed into the blood and runs on ahead, as it were, to strike down whatever nutritious principle has escaped destruction hitherto. It attacks the red blood corpuscles, shrivels them, and renders them unable to perform their function of oxygenating the blood. It is especially deadly to protoplasm and nerve tissue. It enters the cell by the principle of osmose. This is best understood by an example:

Nearly fill a bladder with alcohol, and place it in water. The two fluids, having attraction for each other, will move in opposite

directions through the septum with a velocity determined, not by their relative weights, as might be supposed, but by the relative attraction which the animal tissue has for each. Ordinary tissue and cell envelopes have more affinity for water; consequently in the illustration the amount of fluid in the bladder will increase in volume. Repeat the experiment, reversing the liquids. Water will now pass out of the bladder faster than alcohol will enter, so that in a short time the bladder becomes shrunken and shriveled. Thus extracting water from the blood corpuscles and all kinds of tissue cells but one, and partially replacing it by itself, it goes to the extent of its quantity in stopping the functions of the body. The peculiar constitution of the nerve tissue gives it more affinity for alcohol; consequently a large quantity of that fluid enters the nerve cells and tissue. Once there it paralyzes the nerves. All physical action, whether voluntary or involuntary, is controlled and directed by the nerves. Where there is nerve there is life. Whatever interferes with their action invites death.

From one illustration learn the whole matter. Involuntary muscular action, such as the throbbing of the blood vessels, is under the control of the sympathetic nerves, or nerves of organic life, which form a system quite distinct from the cerebro-spinal center, though connected with it. The nerves of organic life which control the capillaries of the blood vessels succumb first to the influence of alcohol. While the heart and larger blood vessels expand and contract with nearly normal force, the capillaries have lost their power to do so through the paralysis of their nerves. Consequently the blood is forced into them and remains there. This causes the flushed and reddened skin of the inebriate. The same phenomena may be caused by cutting the nerve, by freezing, pinching, or pounding any part. The so-called blood blister is an extreme case of the same condition. Death is there. Under the influence of alcohol, all the capillaries throughout the whole body become congested, and a state of incipient death exists. From this beginning the terrible effects of alcohol on the human body may be inferred. Facts show that it kills thousands annually, puts in jeopardy the lives of thousands, and destroys the happiness of tens of thousands more. So that if it

be distinctively the duty of the sanitarian to teach how to preserve health and save life, he cannot ignore the obligation of inculcating temperance in all things; and while he abates a stench or kills a microbe, he cannot overlook the greatest disgrace to civilization, or fail to oppose a foe that attacks like an armed man.

There is danger from poisons which develop in food before it is taken into the body. Since the discovery of bacteria and the part which they play, a great deal of light has been shed upon sanitary questions. If it were not for the bacteria of decay, a piece of meat or vegetable might remain undecomposed perhaps forever; but immediately the vital principle departs under whose control and protecting power the organism was built up, it becomes a prey to bacterial life. Millions upon millions of infinitesimal creatures devour dead organic matter for their purpose, producing substances which are poisonous to themselves and often to other forms of life. These poisons, formed during the putrefaction of organic matter, are termed ptomaines, from a Greek word signifying a dead body. "They are temporary forms through which matter passes while it is being transformed by the activity of bacterial life from the organic to the inorganic state. Complex organic substances, as muscle and brain, are broken up into less complex molecules, and so the process of chemical division goes on until the simple and well-known final products, carbonic acid gas, ammonia, and water, result; but the variety of combinations into which an individual atom of carbon may enter during this long series of changes is almost unlimited, and with each change in combination there is more or less change in nature. In one combination the atom of carbon may exist as a constituent of a highly poisonous substance, while the next combination into which it enters may be wholly inert."

There are two great classes of bacteria: those which thrive best in plenty of air, the aërobic; and those which flourish most in little or no air, the anaërobic. So of course different kinds of ptomaines are produced under the varying circumstances of air, temperature, and moisture. Doubtless purely chemical changes occur to some extent during putrefaction and in the formation of

some ptomaines, as chemical affinity always stands ready to assert itself under favorable conditions.

It is not rare to hear that several persons have been taken suddenly sick after eating certain kinds of food. The kinds of food which are most likely to produce these results are mussels, oysters, eels, sausage, ham, canned meat and vegetables, cheese, milk, ice-cream, and bread made from stale meal. The poisonous substance sometimes found in milk was named tyrotoxicon, cheese poison, by its discover, Dr. Vaughn, because found in cheese.

On August 7, 1886, several cases of sickness occurred at hotels at Long Branch. Milk was delivered at the hotels twice a day, morning and evening. The milk which caused the sickness was delivered in the evening, and was from one farm only, although several farms furnished milk for the hotels. It was found that the cows at this farm were well fed and healthy. The milking, however, was done at the unusual hours of midnight and noon. The milk which produced the illness was placed, while warm, in cans, and without any attempt to cool it, was carted eight miles in the warmest part of the day. The improper care of the milk in this case, without doubt, led to its poisonous character. Analysis of it showed the presence of tyrotoxicon.

In 1887, four cases of milk poisoning occurred in a family at Milan, Michigan. Three of these cases were fatal. Novy and Vaughn obtained tyrotoxicon from the milk and from the contents of the intestines in one of the fatal cases. Some of the symptoms in these cases were severe vomiting, flushed face, although the temperature was below normal, 94°–96°F., pulse rapid and weak, throbbing of the abdominal aorta, white, heavy coat upon the tongue, labored and rapid breathing, dilated pupils; a rash like that of scarlet fever appeared in one case; stupor was a marked symptom in the fatal cases; constipation, instead of watery discharges as is quite usual, was marked in these cases; and in one case there were convulsive movements; there was a burning constriction of the throat, and difficulty of swallowing; the skin was cool and about naturally moist. The family lived upon simple healthy food. Their drinking-water was not at fault. The milk was studied. Most of it was fur-

nished for market. It was placed in tin cans which were set in a trough of cold water in the yard. The covers of the cans were so arranged as to allow free access of air. Milk from these cans contained no poison. The family did not use milk from these cans, but that which they did use was placed in pans and kept in the buttery, a small room in one corner of the kitchen. The milk which had caused the sickness of course could not be had, but some milk taken from the cans was allowed to stand in the buttery over night; it was then found to contain tyrotoxicon. The house was an old one. The floor boards in the buttery had partly rotted away, and a second layer of boards had been placed over the original floor. Between these floors a mass of moist, decomposing matter, the accumulation of years, was found; it had a peculiar nauseating odor, and caused vomiting in one of the persons engaged in the examination. A little of this dirt was added to good milk, and in a short time tyrotoxicon was found in it.

If milk is placed in bottles and allowed to remain several months, this poisons develops. Milk had been spilt upon the floor, frequently, perhaps, and running under the boards, could not be removed. In this way an excellent condition for the development of the poison was afforded. The germ or ferment was taken up by the air of the room and absorbed by the milk. It is well known that milk readily absorbs odors; therefore the greatest care and cleanliness should be exercised in managing it.

Cases of poisoning by ice-cream quite often occur. A notable case is the one which occurred at Lawton, Michigan, in 1886. Two kinds of flavoring had been used in this case, vanilla and lemon. As the lemon cream did not affect any one unpleasantly, while the vanilla did, it was thought at first that the vanilla extract contained the poison; but Novy and Vaughn took at first thirty drops each of the extract and no ill results followed. Then one of them took two teaspoonfuls of it with no result. Upon investigation it was found that the lemon cream was frozen first, but that the vanilla cream had been allowed to stand for some hours before freezing in an old building which a resident described as follows: "The cream was frozen in the back end of an old wooden building on Main street. It is surrounded by

shade, has no underpinning, and the sills have settled into the ground. There are no eave-troughs and all the water falling from the roof runs under the building, the streets on two sides having been raised since the construction of the house. The building had been unoccupied for a number of months, consequently had had no ventilation ; and what is worse, the back end, where the cream was frozen, was last used as a meat market. The cream which was affected was that portion last frozen ; consequently it stood in an atmosphere like that of a privy-vault for upward of an hour and a half or two hours before freezing." The symptoms of the poisoning were as follows: About two hours after eating the cream every one was taken with severe vomiting, and about six hours later with purging. The stools were watery and frothy, the vomit was soapy, some griping of the stomach, severe occipital headache, backache, bone pains all over the body, throats were swollen, some were stupefied, others were cold and experienced muscular spasms, temperature was normal, pulse from 90 to 120, tongue dry and chapped. The vomiting lasted two or three hours, after which all were thirsty. After getting out no one of the victims was able to be in the hot sun for several days.

Generally there is nothing in the appearance or taste of cheese which contains tyrotoxicon to excite suspicion. Dr. Vaughn found that a freshly cut surface of poisonous cheese was apt to contain drops of a slightly opalescent fluid, which reddened litmus paper intensely ; no peculiar odor was discernible ; but he found that if a sample of good cheese and one of poisonous cheese were given to a dog or cat, the animal would invariably select the good cheese. If only poisonous cheese was offered, and the animal was hungry, it would eat it.

Tyrotoxicon has been found in poisonous oysters. No specific poison of putrefaction has been found in poisonous mussels, sausage, or ham, nor in canned meat and vegetables ; but what is known of poisons produced during putrefaction gives good ground for believing that their poisonous character is due to ptomaines.

The use of salicylic acid and other preservatives in perishable articles of food is a source of danger and should be prohibited.

Recent experiments with salicylic acid warrant the conclusion that it interferes with important digestive processes. Better sacrifice some of the industries of the country than destroy the public health.

Articles of clothing, fabrics, and wall paper often contain poisonous coloring substances, usually arsenic. Green tarlatan and "foulard cambric contain arsenic." "Cretonnes used for covering furniture, for lambrequins, and for bed-hangings, chintz window curtains, cloth linings for baby carriages, and cloth for carpets" have been found to be arsenical. Irritation of the skin and poisoning have frequently occurred by wearing stockings containing arsenical coloring matter. Light red, magenta, and brown colored stockings have been found poisonous. "Fatal cases of poisoning from the green flannel lining of boots, and poisoning by maroon flannel shirts, by calico shirts, by gloves, coat sleeves, hat linings, and paper collars" have occurred. Arsenic is sometimes put into the dressing for collars and cuffs to give a beantiful gloss. Highly colored confectionery often contains arsenical and other poisonous substances. Poisoning from wall paper which contains arsenic is caused by inhalation of the dust of the paper, which is easily brushed off even by currents of air. It has been shown also that the exceedingly poisonous gas, arseniureted hydrogen, sometimes occurs in the air of rooms covered with arsenical paper, formed probably by slow chemical changes going on in it. It used to be thought that the green colors alone contained arsenic, but this is not so; it may occur in nearly every color.

The symptoms occasioned by poisoning from small quantities of arsenic are quite variable. If the poison is received from wearing apparel, there is generally irritation of the skin, local eruptions, or sores; sometimes inflammation of the stomach, vomiting, and purging occur; the mucous membrane of the eyes, nose, mouth, and throat is often inflamed; sometimes the nerves are affected as if by a narcotic poison; great depression, sleeplessness, soreness of the muscles, and weakness are quite general symptoms.

The amount of arsenic which authorities have thought allowable in wall paper as non-poisonous, and as received from impurity

of the chemicals used in its manufacture, not from the pigments used, is one half grain per piece 21 inches wide and 12 yards long.

The following case is valuable chiefly because it shows that a paper containing but a little more than twice this quantity produced poisonous symptoms: In September, a sample of wall paper was received for analysis, through the State Board of Health, from Prof. Rounds, principal of the State Normal School. Analysis showed that this paper contained 1.141 grains of arsenious acid per piece of the size named above. Under date of September 27, Prof. Rounds wrote, after inquiring whether it would be safe to put new paper on over the arsenical paper: "I will add in reference to the paper which you analyzed that we were led to send the paper for examination by peculiar and distressing effects produced by sleeping in the room, and which disappeared at once on changing to another room."

It is not safe to paper over an arsenical paper. A case to the point occurred recently in Berlin. A woman and her child were taken ill without any apparent cause. After removal to another room they recovered, but after returning became ill again. Upon investigation it was found that the wall of the room carried three layers of paper. The two outer layers contained no arsenic, but the original paper contained a large quantity of it. Doubtless many rooms throughout the State are covered with arsenical paper, and the occupants are suffering the consequences without knowing what ails them.

Tobacco is a poisonous substance. Nicotine, the active principle in it, is one of the most deadly poisons known. A fatal dose of it, which is not more than two or three drops, will kill a man in five minutes, and one tenth of a grain of it will kill a dog in ten minutes. There are the best of reasons for believing that, although the human body may become somewhat inured to it, its use is productive of a great deal of ill health, leading to disease of the kidneys, nervous affections, and insanity.

Dr. Auld, an eminent physician of Glasgow, claims that the appearance of albumen in the urine is one of the results of chronic nicotine poisoning, and that the use of tobacco may lead to organic disease of the kidneys. According to him, it "poi-

sons both the nerve centers and the nerve ends, causing muscular twitching and various other nervous symptoms."

Tobacco is especially injurious to the young. The "Medical and Surgical Reporter" gives a case of the poisonous effects of tobacco smoke on a child. A little girl less than two years old, who had always been healthy, after being less in the nursery and more with her father, who was a great smoker, gradually became feeble and ailing; her appetite was lost, digestion was out of order, she complained frequently of sickness, she did not sleep well, and was restless. During the summer she passed a few weeks in a country town with her mother. There she soon became healthy and robust; but after returning home the old symptoms quickly appeared. It was thought the neighborhood did not agree with her. A sanitary survey was made, but nothing about the surroundings was found wroug. Preparations were being made to take her into the country again, when she took cold and was confined to one room entirely for three weeks. Meanwhile she completely recovered, not only from her cold, but became in every respect well. After joining the family she became sick again, with the old symptoms. Soon her father was called away from home; the child rapidly became better. The truth flashed upon the mother; it was tobacco smoke that was poisoning the child. Tobacco smoke inhaled for some time by adults who do not use tobacco will produce symptoms of poisoning. This fact is well known. It is equally well known that children are more susceptible to hostile influences than are adults. There is no doubt whatever that thousands of weak and sickly children are rendered so by inhaling air loaded with tobacco smoke, and doubtless hundreds of them are carried to an early grave on account of it.

M. Bourrier, an inspector of the slaughter-houses of Paris, made experiments to learn the influence of tobacco smoke on meat. Some raw minced beef was exposed for some time to the fumes of tobacco and then offered to a dog; he refused to eat it. The meat was then concealed in some bread, and the animal ate it. At the end of twenty minutes, symptoms of poisoning set in, and soon the dog died of horrible convulsions.

These cases illustrate the great danger that may be lurking in the most unsuspected causes. We are not prepared to say

whether articles of food exposed to the fumes of a dozen tobacco pipes in a grocery store, day after day, are prejudicial to the health of the consumer, but indications point in that direction.

Cigarettes probably constitute the most pernicious form in which tobacco is used, because in them its own poison is mixed with several other poisons almost as deadly. To make them or sell them is a crime, and should be treated as such.

The great end of the sanitarian — good health and the prevention of premature death — will be accomplished through proper food, proper surroundings, proper exercise, proper precaution, and the advancement of medical and sanitary science. It was never intended that man should be cut off prematurely. Because a thousand buds upon the trees are blighted to one that bears fruit, has no comparison for mankind. The higher the rise in the scale of being, the nearer is the approach to perfection. It is the violation of natural laws in a hundred directions which shortens life. The lower animals live five times the period of their growth. A dog grows until two years of age; he lives ten or twelve years. A horse grows for five years, and lives twenty-five years. Man grows until twenty, and ought to live one hundred years.

"The result of the great care taken by the Jews as to their diet is famous everywhere in the extraordinary low death-rate of this people, and their immunity from epidemics which decimate other sections of the population." Mr. De Sola, a Jewish pastor of Montreal, says that the strictest examination is made in the killing of lambs and calves to prevent the communication of disease to man, and that about half of those slaughtered are rejected. In Prussia there are three still-born Christians to one Jew. Under five years of age, 36 per cent of Christians die and only 25 per cent of Jews; while the whole mortality is only 15 per cent for Jews but 23 per cent for Christians.

Some earnest of an earthly millennium is given in the constant lowering of death-rates where care is exercised in sanitary affairs. Not many years ago the death-rate in London was twenty-five per thousand of population; now it is about nineteen; this reduction in the death-rate means the saving of six lives among every thousand persons; or, the saving of 24,000 persons from

untimely death in the city of London. Without question the average age of man now is nearer forty years than it was a quarter of a century ago. Improvement of the race through heredity under sanitary rule will be just as certain as the decline of mankind has been through the transmission of infirmities. It is more than probable "that hereditary taints may be abolished by proper living, and the body left at death stronger and better than when it was taken up at birth, because the old blood cells and fibers, and the epithelial scales being cast off, may be replaced with others better and eventually untainted."

Prophecy declares: "There shall be no more thence an infant of days, nor an old man that hath not filled his days, for the child shall die an hundred years old," and "as the days of a tree shall be the days of my people."

Thorough and continued application of sanitary science will emulate the prophecy.

PREVENTION AND CURE OF DISEASE.

BY G. P. CONN, A. M., M. D., PRESIDENT STATE BOARD OF HEALTH, CONCORD, N. H.

It is only a few years since, that an apology would have been considered necessary in introducing the subject of prevention of disease in the profession of medicine. Until recently, young men intending to fit themselves to become disciples of Esculapius assembled in their preceptor's office, or in the lecture room, and read or listened to the orthodox teachings on the theory and practice of medicine; with hard study memorized the anatomical structures of the human body, while *materia medica* and therapeutics received a full share of their attention, for it was expected that medical students were to devote their time and energy to the great problem of how to cure disease. But little attention was given to the prevention of disease, and we read that not infrequently disease and death were regarded as a part of the dispensation of Divine Providence.

It is true that Jenner had made the discovery that vaccination would modify variola, and thereby transform a terribly loathsome and dreaded disease into a mild and comparatively harmless form of indisposition; but it was also true that by a great many Jenner was considered little more than a crank, and even now there are some people who see in every sickness an infliction caused by Divine Power for purposes of punishment or premonition, while in Europe and America the leaders of the Anti-Vaccination Unions profess to believe that it is contrary to the designs of nature to interfere, or interpose anything so radical as the substitution of one disease to modify or control another.

The great advancement in sanitation that has been made in

modern times had its inception early in 1855, when Lord Panmure, moved by the most distressing condition of the sick and wounded in the hospitals of the Crimean army, commissioned Dr. Sutherland, Dr. Gavin, and Mr. Rawlinson to proceed to the Bosphorus and to the Crimea, and to take instant measures for the improvement of the sanitary state of those sadly crowded buildings.

Mr. Rawlinson, a man of sound sense and great practical skill, a genius for direct and positive action, and then in the prime of life, was quick to apply to the appalling conditions with which he was confronted those well-trained abilities which had already marked him and which still mark him as one of the great lights of sanitary engineering.

The order was issued on the 19th of February. In less than three weeks, the work at Scutari was already progressing, and within a month a marked effect was obvious. Then, says Kinglake, came on a change, which, if only it had been preceded by incantations and mummery instead of ventilation, drainage, and a pure water-supply, would have easily passed for a miracle. Down went the rate of mortality, having already been lowered from the terrible February rate of 42 per cent to 31 per cent; it descended in the next two weeks to 14; in the next twenty days to 10; in the next to 5; in the next to 4; and finally, the 30th of June, 1855, to scarcely more than 2 per cent.

This remarkable result was achieved by the physical changes effected by intelligent engineering. It is probably true that it would have been a difficult task to accomplish in civil life during this short period all that was effected with military discipline, for with a mass of people whose first duty is to obey orders, it is comparatively easy to bring about results, arbitrary or otherwise, which would be almost unattainable when dealing with those that require a reason for every action.

Since that period the public mind has become more and more enlightened with reference to the nature of disease. It is more and more apparent that while many affections may not be subject to control, there is, on the other hand, a vast amount of preventable disease, and the conclusion is legitimate that where prevention is possible, prevalence is evidence of criminal neglect.

Naturally the public turn to the medical profession for the solution of all questions in which human health is involved, and the province of the physician at the present hour is not only to deal with those that are sick, but also with those who are well. And by so much as a man is more valuable to the State in health than he is in disease, should the State be interested in preventive medicine from a financial standpoint alone.

During these later years hygiene has made great strides, and its possibilities are developing more each year. Sanitary medicine may be far from an exact science, still the rational application of the principles of hygiene and sanitation have wrought such changes in the work of the surgeon and the possibilities of surgery, as to lead the public to expect of the profession deeds that would have been considered daring, and results that would have been deemed unattainable, a quarter of a century ago. The surgeon no longer hesitates to explore the serous cavities, should the nature of the case render it certain that such an operation is necessary for the purpose of a cure or as a matter of diagnosis, neither is such a process considered especially dangerous. The surgeon applies the principles of hygiene to the preparation of his patient, and conducts his operation with due attention to the prevention of sepsis; while the abdominal cavity, the pleura, the joints, and the cranium are no longer regarded as forbidden fields to the surgeon.

The recuperative power of tissues, when protected from the septic influences of putrefactive micro-organisms, allows the most brilliant results to follow the work of the surgeon, and adds very much to his renown. When we canthrow the mantle of Hygeia around the victim of accidental misfortune, and surround his wounds with such sanitary precautions that nothing septic shall touch the abraded surface, then the work of the surgeon will be greatly simplified. So, too, when we can eliminate contagious and infectious diseases from the mortuary reports of the physicians, the average human life will be prolonged thereby. Theoretically speaking, disease of zymotic origin should never find a place in the nosological tables of the physician. Human foresight should recognize the possible causes of such disease, and provide for their removal and the probability of their recurrence.

Less than half a century ago, a few zealous and patriotic men were regarded as fanatics because they endeavored to save sanitation from becoming one of the lost arts; they also attempted to prove that a great deal of the mortality among the people was due to causes that were clearly within the province of the same people to prevent.

It is quite true that the fundamental principles of hygiene are as old as the world itself, for the rules and regulations that were incorporated into the Mosaic law, and were made a part of the religious observances of the Hebrew people, have scarcely been improved; while it may be added that according to the teachings of the Talmud, a great deal that was considered essential to good health and morals in the days of Moses, is in danger of falling into disuse under the present high-pressure system of modern education. Unfortunately there are a great many good people who have not outlived the idea that disease is a part of the plan of the Creator, and that therefore it must be accepted as in some mysterious way fulfilling divine purpose. The student of hygiene will have but little sympathy with this class of people, for the principles of sanitation are so broad, its scope so universal, and its possibilities so varied, that in its comprehension the mind must meet it with enlarged views, and narrow ideas born of prejudice will be lost in the general progress coincident with a higher education.

Can anything more deeply concern the individual or the family than the acquirement of the most perfect action of mind and body during so long a period as is consistent with the natural laws of life? In the language of Prof. Parkes, "Hygiene aims at rendering growth more perfect, decay less rapid, life more vigorous, and death more remote." What higher purposes can you find in all the arts and sciences, or that should more nearly touch the hearts of the people? For with good health every plan seems feasible, and only energy and perseverance are needed to allow it to be successfully executed. Without health, untold riches and widespread influence are but mockery to one with even ordinary ambition.

It is true that the medical profession has a very laudable desire to cure disease, to make the lame walk, the blind to see; in

short, it is their ambition to become proficient in their chosen profession of remedying bodily ills. This is all right; let us gain all the knowledge that we can in this direction; let us examine into the anatomical structures of the human system, study their physiological and pathological conditions, thoroughly analyze the clinical and therapeutical elements entering into the pharmacological list of remedies which are brought into notice and recommended for our use in dealing with disease, for to the masses the science of medicine has as yet special reference to the cure of disease.

To the novice in medicine it may be too early to speak of the little ounce of prevention that is worth a pound of cure. To the young man about to graduate in medicine, it will be unnecessary to add that medicine is very far from an exact science, for his work in office, lecture-room, and laboratory has already prepared his mind for just such plain truths. The practitioner, having graduated with class honors, begins life anew, ready to build up a reputation upon the cornerstone of the knowledge he has treasured up while a student.

The design of the science of medicine being to cure disease, it is not complimentary to our pride, it does not harmonize with our ideas of professional egotism, nor satisfy our ambition to have a patient do otherwise than to recover health. Accident and old age may be considered good and sufficient reasons on which to base a death certificate. The average layman who believes that the physician should cure all other forms of illness is very prone to discuss our professional merits whenever a death occurs in our practice. Therefore we find ourselves making a mental retrospection of the cases we have attended. Our ambition prompts us to expect that several cases of nearly the same type of disease should all recover, yet in practice this does not always follow, and when a careful review of the work is made, consulting the notes with a conscientious consideration of the time and care that were devoted to each case, it is very evident that there were some elements, some invisible and unknown factor in some cases, that did not enter into nor have a depressing influence over other patients.

For the purpose of illustration, let us go into the sickroom and study the conditions that may obtain in certain hypothetical

cases. Let us suppose these cases to be a type of typhoid fever, such as we so often find in New England; without discussing the origin of the disease, we will accept the circumstances as we find them. The first case we visit is a young man perhaps eighteen or twenty years of age, who has come home from a distant manufacturing town, where he has been engaged in a mill. This building was constructed with a view of securing conditions favorable to the health of the operatives, being properly planned to secure good ventilation, a dry basement, and plenty of sunlight, and with clean surroundings; however, the young man, being of a saving disposition and inclined to economize, took room and board in a house near at hand, where the basement was dark, damp, and moldy. The cellar was used as a storeroom for the family, and contained more or less decaying vegetable matter at almost any season of the year; the first, second, and attic floors were occupied as living and sleeping rooms by so large a number of people that the space allotted to each one was but half what would be considered necessary for fairly healthful conditions. The surroundings of this boarding-house were such as to show that the family was naturally of a shiftless character, as all forms of filth were allowed to collect in the yard; slops were thrown out of doors and windows, as best suited the convenience of the family; the drain from the kitchen sink having become clogged, the overflow was offensive to sight and smell, as it remained upon the surface of the ground. Not very far away was a vault filled to overflowing, while the well, from which the family and boarders obtained their daily water-supply, was situated in such close proximity that the sink-spout, the vault, and the well formed the angles of a small equilateral triangle, the first two points being directly under the watershed of the house and L. A short time previous there had been a mild case of typhoid fever in this house, that was not removed to the hospital until after the characteristic dejections took place, which were deposited in this same vault without having been disinfected. The season being a hot and dry one, the water in the well was gradually lowering each day, consequently the solids held in solution became more and more concentrated. About this time the earth was treated to a friendly shower, which allowed the surplus from

the roof to wash away much filth that had accumulated about the house. Nature thus kindly attempted to accomplish a work in sanitation that human foresight should never have permitted to exist neglected, but as it is no part of nature's work to provide against man's predisposition to shirk responsibility, it need not excite especial wonder that, in carrying away this refuse, some of it was deposited in places still more dangerous to the public health, viz., in the well or water-supply.

If we admit the existence of the typhoid fever germ, we must also acknowledge that it might easily be transferred through the porous soil to the water of the well. When this is done it need not be long before this germ would find its way to the enteric surfaces of the anatomical structures of those using the water. It is unnecessary to discuss in this place the reasons why all using this water were not made ill. It will suffice our purpose to grant that this young man had lived in this unhealthful atmosphere so long that his system was in a receptive condition, peculiarly favorable to the immediate development of the disease. Now this case was the second one to have been taken ill in that boarding-house, and the attending physician, learning that the patient had a good home a few miles distant, and realizing that one ill in a boarding-house can receive only indifferent care, promptly sent the young man home before he had become too sick to be moved.

Here we are introduced to him, with all the typical symptoms of typhoid fever, that every physician would recognize at once. But we also find him in an intelligent household, who are ever on the alert to prevent unwholesome conditions from finding an abode about the premises. The cellar is dry, well ventilated, and free from decaying animal and vegetable substances. The outlook from the buildings shows every part of the grounds to be in such a neat and cleanly state as to be welcome to the sight, and not the slightest disagreeable or offensive odor can be detected about the premises. The water-supply is one hundred yards distant from the house and on a much higher level, and is thoroughly protected from possible pollution. Here are hygienic conditions favorable to health, and to its restoration in case of illness. We will leave this patient for the present, and investi-

gate the circumstances surrounding a second one, whom we find to be of about the same age, but apparently more robust than the first.

He has always labored upon a farm, is an energetic, persevering sort of a genius, although not over-careful of himself or his premises. He is one of those easy-going fellows who never seem to have any anxiety about the health of themselves or their families; really he was more inclined to the belief that fate or destiny has much to do with life, health, and happiness, therefore it mattered not that his cellar was dark, damp, and untidy, nor that the grounds about his buildings were unkempt, unwholesome, and fostering disease germs. It did not disturb him that the water-supply was in danger of becoming polluted, nor that the atmosphere of the house was so contaminated by gases arising from putrefaction going on continuously in and about yards and outbuildings, as to be recognized at once on entering the dwelling from the pure air outside. Nature's prerogative, that to secure and maintain health one must have pure air, pure water, and an uncontaminated soil, finds no sympathy in the mind of such a person. Believing that sickness and death are but tangible evidences of some mysterious dispensation of a higher power, he is blindly content, for had not his father and his grandfather resided on this same spot and under the same conditions, and if it was good enough for them, why should he complain? True, he is the last of a numerous progeny that barely escaped death in childhood from scarlet fever, diphtheria, or some kindred disease, or perished later in life from phthisis.

These are not altogether fancy sketches. Many a professional man realizes in a few months' practice that these are not overdrawn pictures. It may be said that so far as the symptoms described in text-books are concerned, these cases have much in common, but a tyro in medicine will not hesitate to affirm that in other conditions they are totally unlike. Case 2 seemingly has the advantage of weight and muscular power; yet there is a wide difference in the sanitary conditions of the two homes that constitutes an unknown factor in development of the disease, for case 2, after falling a victim to the fever germ, remained within the circle of infection that was instrumental in the origin of the

disease, and it cannot be denied that his natural recuperative power is weighted down by an incubus that so far destroys the tone of the nerve centers that assimilation and elimination can only take place in a feeble manner, and therefore these natural assistants to the physician are of little or no avail.

Now in consideration of the fact that in one case the air the patient breathes, the water he drinks, and the food on which he is to be sustained, are all more or less contaminated, while in the other he has been promptly removed from these unhealthful surroundings into well-ventilated rooms, with pure air to breathe, pure water to drink, and good wholesome food on which to sustain the body against the depression occasioned by the fever, the prognosis in these two cases must be widely different, else the physician and the friends will be disappointed.

Neither case may prove fatal, for it is a well-known fact that people will live for a considerable period, and even recover when dangerously ill, in places that have serious defects; yet, under such circumstances, we cannot rely upon that assistance from nature, *vis medicatrix naturæ*, which would obtain in a similar case with improved sanitary conditions.

It is not easy to explain why reasonably intelligent people will be so totally indifferent to what constitutes true hygienic conditions of the home and family. Sometimes their actual sanitary state is overlooked in the hurry and bustle of business; in such instances the physician has only to point out the unseen faults, and they will be remedied at once. Among such people the work of sanitation is a pleasure; but when medical assistance is summoned to a family that has been habitually slack in sanitary matters for generations, and that firmly believes that what was considered good by father and grandfather cannot be otherwise than perfect to-day, the task will be environed with many misgivings and discouragements; for the physician is expected to cure the patient, just the same as if surrounded with the most favorable circumstances that hygiene could suggest.

I have a most vivid recollection of a family resembling case 2, which was always an enigma to me, for I could not satisfactorily solve the problem of their manifest indifference to sanitation. This family was noted for its punctual attendance at

church on Sundays, and after thus complying with divine wishes, they evidently felt at liberty to set at defiance all ordinary rules and regulations of nature and hygiene. Perhaps that church edifice influenced the head of the house in forming his ideas of healthful surroundings, for he invariably went to sleep in its unventilated and unattractive simplicity, and whenever he sat down in his own home, he did the same; therefore it is quite possible, that, reasoning by analogy, he concluded that similar effects were produced by similar conditions, and if an edifice erected and consecrated for the worship of God was not an example to follow in architectural work, where should he find a better one? However, the fact still remained that the air, the water, and the soil about his house were thoroughly contaminated, and there was no "mysterious dispensation of Divine Providence" about his sickness, unless it was that it did not visit him sooner. It is true that a physician was often called to his home, for his wife and children were frequently complaining of sore throats and general lassitude; and an undertaker had assisted in the closing scenes of one child that had died of croup, of another that diphtheria had carried away, and of a third that had succumbed to the wasting of marasmus. In the opinion of such people, physicians are to cure "sick folks," and therefore with such environments they change from one medical attendant to another, summoning each to combat disease with skill in medicines, deserted by every helpful force of nature.

However, the true physician will realize that the family is only paying the penalty for outrageously violating the laws of health, and therefore will be quite reconciled to leave it to its idols. It is very true that the human system will bear a great strain upon its recuperative powers, as exemplified in its tolerance of an amount of opium or arsenic that would prove fatal to one not habituated to its use, and the same may be said of the extremes of heat and cold which it will undergo; yet there is a limit to this power of endurance, and in some unexpected moment, when the vital energy has become thoroughly worn out in its conflict with unseen micro-organisms, nature yields from sheer exhaustion, and the patient is left a victim of his own perversity.

The physician must take cognizance of the various hygienic conditions that surround the patient, and sometimes it requires

more tact and good judgment to secure a fair portion of "God's best gifts to man," pure air and water, than to select the class of medicines best adapted to the case. This but feebly illustrates the position of the physician, for while he has received an education with a view to assist nature in the cure of disease, how can he do good work in an atmosphere of filth, or without the aid of friends and nurses having an intelligent knowledge of sanitation?

As hygiene refers to everything that has a direct or indirect influence upon the health of individuals or communities, the enthusiastic student, after reforming conspicuous evils, will seek for possible causes of disease, when others would not consider it necessary. While he examines the best means to avoid contagion, infection, and pestilence, he becomes convinced that very often sickness is occasioned and disease aggravated by a variety of causes that might easily be removed by an intelligent co-operation of the physician and the family.

Years since, it was said by Dr. Nathan Smith, the founder of Dartmouth Medical College, that in certain diseases like fever, "the duty of the physician was like that of the sea captain in charge of a ship in a gale of wind. He is as utterly powerless to expel the disease as the seaman to control the winds and waves. Yet both can so arrange and manage their charges that the best possible opportunity shall be given for surviving the tempest." The truth of this comparison is generally admitted by physicians at the present time. But suppose the student of hygiene and sanitation can point out from whence the storms arise and declare the laws governing their development and progress, and furthermore show distinctly that they may be tempered in their course, or suppressed in their origin, indeed, actually prevented, may it not be said of him that he controls the winds and waves of disease and death, and is not his position one of incalculable dignity and value to the individual, the community, and the State?

These are the discoveries that advance rational medicine and prolong life. They are not evolved from anybody's internal consciousness, which forms no element in the healing art; but they are deduced from observation, not only at the bedside but

from every point about the premises that will yield any information of what the physician and his patient must struggle against and overcome to secure a return to health. We may not always at the first glance see how immensely important these discoveries are, nor do we always note in the constantly fresh recognition of the causes of disease and the means of their prevention our actual rate of progress in sanitary matters. Almost every one to-day will admit that if two young men, both inheriting that weakness which is sometimes called a consumptive tendency or diathesis, should work, the one in an ill-ventilated shoe factory and the other in a lumber camp in Canada or Wisconsin, the latter will enjoy the longer life and will be less inclined to the development of phthisis. Our grandfathers in medicine did not realize this. They protected persons with such a tendency from the fresh air, fearing that they would take cold, coddled them in feather beds, and imperfectly nourished them, but gave plenty of medicine.

Bowditch and Loomis have demonstrated that many a person with weak lungs can live for a long period if he will consent to reside in an elevated, dry climate and in the open air, and if the products of respiration and secretion are promptly removed. The profession understand many phases of hygiene and its relation to medicine and surgery that were regarded as a sealed book only a few years since; yet as one problem after another is solved, others that have never been imagined appear, demanding an explanation. From this comes a lesson of humility, for in sanitation, as in medicine, no one has yet arrived at perfection. Therefore the student of to-day, although starting from an advanced position as compared with that of fifty years ago, will yet find much that is new, and has many untrodden paths that he may explore.

As the growing perfection of machinery has modified the methods of labor, thus changing the character of wounds brought to the notice of the surgeon, and as the modern high-pressure system of business has created, developed, and fostered passions and various emotional disturbances that present to the physician types of disease infrequent or unknown half a century ago, so in this ever-changing world the student in hygiene and sanitation

will find it necessary to be always a student. In hygiene as in the other departments of medicine, the good will endure through the varying opinions of succeeding years, and the worthless will be rejected; faith will often be rudely shaken to find so much that will not bear the light of thorough investigation, but these disappointments come in every association of life.

There is no royal road that leads to health, nor can it be secured without effort. It has been decreed that only by labor can one attain excellence, mentally or physically. It is equally certain that health is an entity which cannot be bought with gold nor governed by statutes; the throbbings of a fevered brain will not be palliated by an embroidered pillow nor a purple canopy. International and state lines or municipal boundaries have no terror for an epidemic of small-pox, yellow fever, cholera, or other pestilence whose subtle presence may be felt in darkest midnight, yet cannot be seen by the light of the noonday sun. The grim monster will demand from affluence an unconditional surrender of all the good things transmitted by heritage, acquired by industry, or accumulated by avarice. Pain and suffering, whether occasioned by accident or ignorance, have no respect for persons. Fame cannot defy the stings of sickness, nor power neutralize the agonies of pain. The renown of many a victory could not diffuse an anodyne influence over the pillow of Napoleon, nor could the laurels of Austerlitz and Marengo defend him from the discomforts and dangers developed by the fogs and malaria of the "lone barren isle."

The study of medicine, unlike that of almost any other branch of art, literature, or science, intends to fit its votary to deal with the life and happiness of men, rather than with their business or their ambitions. The life-work of the physician may lead him to study the organic defects of man himself, rather than the government under which he lives; yet it is to the laws of the State and nation that he must look for the enforcement of sanitary rules and regulations necessary to secure to every person his unalienable rights to pure air, pure water, and pure soil.

The mental worth of a man is always interesting in connection with his bodily ailments, as an indication of his ability to comprehend the conditions necessary for his physical improvement.

The physician soon learns to examine his patient for the inherent or acquired power to resist the invasion of disease, or his ability to meet its varied indications and his certainty to overcome its depressions, rather than to inquire into his social advantages and position. The house and its adornments may have a pleasing effect upon the eye, yet in the sickroom the mind naturally reviews the situation from a realistic rather than an æsthetic standpoint. The possibilities of bad drainage, insufficient or no ventilation, unwholesome food, or unskillful nursing, have a decided tendency to make one assume the *role* of inquisitor, rather than to accept any general statement that everything is all right.

Glazed and tinted wall paper may be laid so artistically as to add very much to the beauty of an apartment, yet should the occupant of that room develop a sore throat, weak eyes, or some eruptive disease, as well as an irritable stomach, and should an analysis of that beautiful paper show that it required from five to ten grains of arsenic to the square foot to produce this pleasing effect, sound reasoning would dictate that we should educate the special senses less and give more attention to the body. It is unnecessary that a medical student should become a materialist, but he must become a philosopher, else his calling will soon have but little that will charm him in his daily encounter with mysteries defying solution. Our world is large, and in the oscillations of public opinion the pendulum of real progress swings from side to side without leaving any impression to mark its way, and with but little noise to represent the great work all the time going on.

A good student is ever a student. Graduation exercises only serve to stimulate study. That man learns most who is early to realize that a well-balanced mind can only be maintained by a daily and ever increasing supply of judicious mental effort. Happy is he who always finds the supply equal to the demand, for an aimless existence forms no part of the life of the student. While his work is never completed, he always has a goal before him, and his ambition will not tolerate idleness. Let us all be students, and we shall pass to and fro in this world as the shuttle through the web, occasionally catching a glimpse of the pattern

we are helping to weave; yet our vision is so transitory, the lights and shadows so complex, and the colors so obscure, that it often seems as if we were working upon the wrong side of the texture instead of the right. But the pattern is very large, and each of our lives forms but a single thread running through the whole piece; hence it is not strange that it often seems distorted and shapeless, nor that our little labor seems lost in the great harmonious whole. Associated and united labor will always accomplish results that would be unattainable by personal effort alone; and nowhere is this better exemplified than in the study of medicine and hygiene.

Classwork has its peculiar advantages, for minds, like metals, cannot come in contact with each other without receiving some form of an impression; the more forcible the contact, the more vivid the imprint will appear.

Mental attrition develops all the latent powers of the brain, sharpens every faculty and quickens the understanding; therefore comprehension and perception are improved, that which was dim and misty becomes bright and clear, the outlook broadens, the possibilities expand, and bigotry, superstition, and intolerance find no place in the heart of the true student of hygiene and medicine.

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